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ABSTRACT

The quality of preparation for college provided students by Ontario's educational system was assessed. First-year university achievement was compared for students from Ontario's Grade 13 and for students from the final matriculation year or equivalent of other Canadian provinces. University admission procedures were also studied to determine to what extent special requirements or adjustments were made for students who completed their secondary school education in different provinces. Additionally, the university achievement of the better students and the adjustment problems of all students in the first and second years of the university were examined. Four Ontario universities and two out-of-province universities that enrolled a significant number of students from Ontario were evaluated. Findings include the following: where secondary school grades were either specified or implied as admission requirements, Ontario students were typically allowed to gain entry into Ontario universities with the lowest grades of all students, followed by students from Quebec, Western Canada, and Atlantic Canada; in the Quebec university admission requirements to the arts, science, and commerce programs equate Ontario Grade 13 graduates with year of College d'enseignements generale et professional graduates and require students from other provinces to take a qualifying year; in comparison with students from other provinces, Ontario students in Ontario universities tend to receive higher marks in engineering and do as well or better in arts, science, and commerce; Ontario students tended to enter the university at a later age than students from all other provinces except Quebec. (SW)

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ACHIEVEMENT OF ONTARIO GRADE 13 STUDENTS IN UNIVERSITY

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Contents

Abstract		vii
I.	Introduction	1
	The Cases for and Against Grade 13	1
	Organization of the Report	2
II.	Grade 13 in Historical Perspective	3
III.	Research Design	8
	The Structure of Education in Canada	8
	University Case Studies	9
	Achievement of the "Better" Students	10
	Social and Emotional Adjustment at University	10
	Age at Entry to University	10
	Secondary School Curriculum	11
IV.	The Findings	12
	The Structure of Education in Canada	12
	Characteristics of Provincial School Systems	12
	University-Admission Requirements	13
	Case-Study Universities: Accommodations and Achievement	16
	University A	16
	University B	26
	University C	30
	University D	31
	University E	39
	University F	44
	Achievement of the "Better" Students	46
	Social and Emotional Adjustment at University	52
	Age at Entry to University	53
	Secondary School Curriculum	56
V.	Summary and Conclusions	59
	Summary	59
	Grade 13 as Preparation for University	59
	Adjustment to University	61
	Age at Entry to University	61
	Provincial Differences in Secondary School Curriculum	61
	Conclusions	62
	Limitations of the Study	62
	Concluding Statements	62
VI.	References	64

Figure		Page
Figure 1:	Organization of Education in the Ten Provinces and The United States	14

Tables

Table 1:	University-Admission Requirements for Students From Within and From Outside of Each of the Ten Provinces	15
Table 2:	Minimum Admission Requirements by Province/United States -- University A	17
Table 3:	Program-Admission Requirements--University A	18
Table 4:	Matriculation Marks of Entrants--University A, 1977, 1978, 1979	20
Table 5:	Matriculation and First-Year University Averages--University A, 1977, 1978, 1979	21
Table 6:	First-Year-University Marks of Entrants--University A, 1979, 1979, 1980	22
Table 7:	Comparisons by Region and Program of Unadjusted First-Year Marks--University A, 1978, 1979, 1980	23
Table 8:	Comparisons by Region and Program of Adjusted First-Year Marks--University A, 1978, 1979, 1980	25
Table 9:	Minimum Admission Requirements by Province--University B	26
Table 10:	Matriculation Marks of Entrants--University B, First-Year-University Marks of Entrants--	27
Table 11	Matriculation and First-Year-University Averages--University B, 1976, 1977, 1978, 1979	28
Table 12	First-Year-University Marks of Entrants--University B, 1976, 1977, 1978, 1979	28
Table 13:	Comparisons by Region of Unadjusted First Year Marks--University B, 1976, 1977, 1978, 1979	29
Table 14:	Comparisons by Region of Adjusted First-Year Marks--University B, 1976, 1977, 1978, 1979	29
Table 15:	Minimum Admission Requirements by Province/United States--University C	30
Table 16:	Comparisons by Region and Program of Unadjusted First-Year Marks--University C, 1977, 1978, 1979	32
Table 17:	Percentage of Students by Program and Region who (a) Completed Year 1 Without Failure (b) Completed Year 1 With One or More Failures (c) Withdrew--University C, 1977, 1978, 1979	33
Table 18:	Matriculation Marks of Entrants--University D, 1978, 1979	35
Table 19:	First-Year-University Marks of Entrants--University D, 1978, 1979	36
Table 20:	Comparisons by Region and Program of Unadjusted First-Year Marks--University D, 1978, 1979	37
Table 21:	Comparisons by Region and Program of Adjusted First-Year Marks--University D, 1978, 1979	38
Table 22:	Minimum Admission and Degree-Program Requirements by Province/United States--University E	40

Table 23: First-Year-University Marks of Entrants--University E, 1978, 1979, 1980 41

Table 24: Comparisons by Region and Program of Unadjusted First-Year Marks--University E, 1978, 1979, 1980 43

Table 25: Minimum Admission Requirements by Province/United States--University F 45

Table 26: Matriculation Marks of Entrants from Ontario and a Western Province--University F, 1977, 1978, 1979 47

Table 27: Comparisons by Program of Ontario Students and Local Provincial Students of Unadjusted First-Year Marks--University F, 1977, 1978, 1979 48

Table 28: Comparisons by Program of Ontario Students and Local Provincial Students of Adjusted First-Year Marks--University F, 1977, 1978, 1979 49

Table 29: Percentage of Students Achieving 80 or Above in First-Year University by Region and Program--University A 50

Table 30: Percentage of Students Achieving 80 or Above in First-Year University by Region--University B 50

Table 31: Percentage of Students Achieving 80 or Above in First-Year University by Region and Program--University C 51

Table 32: Percentage of Students Achieving A- or Above in First-Year University by Region and Program--University D. 51

Table 33: Percentage of Students Achieving a Grade-Point 3.5 or Above in First-Year University by Region and Program--University F. 52

Table 34: Referrals to Student Services for Vocational, Academic, and Personal Counselling--University A 54

Table 35: Percentage of Students in School by Age and Province, 1979-80 55

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A.K.

Abstract

The Secondary Education Review Project's recommendations that Ontario's educational system be reduced by one year is similar to recommendations that have been made on numerous occasions during the past thirty years. This study attempted to assess the quality of preparation for university of Ontario's thirteen-year educational system. The specific purpose of the study was to compare the first-year university achievement of students from Ontario's Grade 13 with students from the final matriculation year or equivalent of other Canadian provinces. University-admission procedures were also studied to determine to what extent special requirements or adjustments were made for students who completed their secondary school education in different provinces. In addition, the study examined the university achievement of the "better" students, and the adjustment problems of all students in the first and second years of university. The age of students at entry to university and differences in provincial curricula were also analysed to explain possible differences in achievement.

Four Ontario universities and two out-of-province universities that enrolled a significant number of students from Ontario were selected for study. First-year marks in the faculties of arts, science, commerce, and engineering were used in the analysis. When it was found that students coming from other provinces to Ontario universities tended to have higher matriculation marks than Ontario students, an adjustment was made to the data to take into account these differences.

The major findings were as follows:

1. Where secondary school marks were either specified or implied as admission requirements, Ontario students were typically allowed to gain entry into Ontario universities with the lowest marks of all students. They were followed by students from Quebec, Western Canada, and Atlantic Canada.

2. In the Quebec university studied admission requirements to the arts, science, and commerce programs equate Ontario Grade 13 graduates with Year 2 CEGEP graduates and require students from other provinces to take a qualifying year.

3. In comparison with students from other provinces, Ontario students in Ontario universities tend to receive higher marks in engineering and do as well or better in arts, science, and commerce.

4. The students who achieved the highest came in similar proportions from Western Canada, Ontario, Quebec, and Atlantic Canada.

5. Students from outside Ontario were slightly more likely to seek academic and personal counselling than were Ontario students, but Ontario students who came from more than 240 km away were overrepresented in all areas of counselling (academic, vocational, and personal). The differences were not statistically significant and were based on the information received from one university.

6. Ontario students tend to enter university at a later age than students from all other provinces except Quebec. More young people in the eighteen-to-twenty-four-year age group are in school in Ontario than in any other province.

7. Differences in provincial curricula in mathematics and English were not considered great enough to explain the differences in first-year-university marks of students by province.

8. There are pronounced differences in the structure of the provincial educational systems from Kindergarten to the completion of a first university degree. These provincial variations would not be substantially reduced by the removal of Ontario's Grade 13.

I. Introduction

A comprehensive review program (Secondary Education Review Project) is currently underway to consider the future design of secondary education in Ontario. One of the important issues being considered is whether there should be twelve or thirteen years in the elementary and secondary school system. Politically contentious at this time, the possible abolishment of Grade 13, as it presently exists, is a crucial issue in Ontario education with far-reaching implications. It is essential, therefore, that a detailed analysis of the impact of Grade 13 on Ontario education be available so that informed discussion and decision-making can take place. It is the purpose of this study to provide some reliable information from which decisions regarding secondary school programming, and particularly the future of Grade 13, can be made.

In its simplest form this study is concerned with the quality of the university preparation of Ontario's Grade 13 students in comparison with that of students from Grade 12 or its equivalent in other provinces. Factors such as student age at university entry and the characteristics of provincial curricula and school organizations were examined to provide a context for the comparisons.

A. The Case for and Against Grade 13

Arguments in favour of Grade 13 have over the years focused on its value as a preparatory bridge to university. Proponents of Grade 13 have argued both sides of the academic issue, claiming that Grade 13 can provide academic breadth or depth. It has been recommended as an exploratory year in which students can consider the broad expanse of human knowledge or, alternatively, as a year for students to concentrate on a few subjects. Interestingly enough, both views have been advanced towards the same goal; that is, that Grade 13 fosters high-achieving university students.

Economic arguments are also put forward on behalf of students. If Grade 13 is equated to a first year of university, it provides an additional year of tuition-free schooling to Ontario students, usually accompanied by the extra savings that result from a student's remaining at home and avoiding away-from-home university expenses. Many students who do not go on to university do stay to finish Grade 13, thus providing themselves with better credentials for the work force than they would possess if a Grade 13 program were not completed.

Finally, it is argued that a thirteen-year system gives students an extra year to develop social maturity and stability before entering university or the work force.

One of the more-important criticisms of Grade 13 is that it places Ontario students at a disadvantage in comparison with students from most other provinces, especially since it takes Ontario students one year longer to complete secondary school. As well, when applying to out-of-province universities, Grade 13 students are not necessarily perceived as superior candidates. The universities in each province set admission policies to accommodate their own population of students. Thus,

each province's universities have their own unique perspective when reviewing candidates. In fact, a review of university-admission standards outside of Ontario shows that students who have spent the extra year in Grade 13 are seldom rewarded with advance university-entrance standing. At the same time, in terms of the admission standards of most Ontario universities, out-of-province Grade 12 graduates are perceived to be on a par with Grade 13 graduates.

B. Organization of the Report

The next section of this report is concerned with a historical review of Grade 13; it examines why Grade 13 was instituted, shows that the current controversy is not the first time that the Grade 13 issue has been faced, and raises some of the traditional arguments for retaining or abolishing Grade 13. Section III then outlines the basic design of the study.

The study's findings are presented in section IV. First, some characteristics of the ten provincial educational systems are presented, along with university-admission requirements. Second, first-year marks of students in four Ontario and two other Canadian universities are compared by program and by origin of student. The admission procedures of these six universities are then reviewed to determine whether Grade 13 graduates are treated differently from high school graduates from other provinces. This is followed by special analysis of the "better" students. In the fourth subsection the social and emotional adjustment of students at one university are considered by region of residence. The last two subsections are concerned with two factors that may be related to differences in university achievement: age at university entry and differences in provincial curricula.

Section V of this report summarizes the findings and makes some tentative conclusions.

II. Grade 13 in Historical Perspective

Unlike the secondary school system in other Canadian provincies, especially the English-speaking ones which typically offer a secondary school program ending with Grade 12, Ontario has a five-year high school program terminating with Grade 13. This is the more remarkable since, as mentioned previously, Ontario universities accept out-of-province Grade 12 graduates or their equivalent--one year of Collège d'enseignements générale et professional (CEGEP) after Secondary V or Grade 11 in the case of Quebec--into their undergraduate programs without the requirement of an additional year of preparation to compensate for the lack of a Grade 13 Secondary School Honour Graduation Diploma (SSHGD). It is not suprising, then, that critics of Grade 13 argue for the elimination of the fifth year of high school and the compression of Ontario's five-year system into four years, since it appears to make no real difference for university-admission purposes. The persistence of the five-year high school system in Ontario is conspicuous since within the last ten years other jurisdictions (British Columbia and New Brunswick) have abolished the extra year or compressed their former five-year high school system into four years.

Although the issue of compression to a four-year high school system has been raised from time to time in the last two decades and, indeed, has been resurrected in the 1980s, it is interesting to note that Grade 13 itself originally represented a compression from the system that immediately preceded it. Although it seems that Grade 13 has been with us forever, it was not coeval with the creation of the educational system. Rather, it was the product of what has been called "quiet evolution".[1] An understanding of this evolution helps to illuminate the current debate.

In its present form Grade 13 can be traced to 1921, when Upper School, which was then a two-year program, was reduced to a single year[2] (at the suggestion of the Committee for Financing University Education) chiefly to encourage students who were not planning to go on to university to complete high school. Prior to 1921, high school comprised the three phases of Lower, Middle, and Upper School, each of which was two years in length. Thus, a full high school program required six years. But with the 1921 innovation the high school system was transformed into the five-year system that has continued to this day. Therefore, contrary to the widely held view, Grade 13, at its inception, did not constitute the addition of an extra year to an extant four-year high school program.

In the early years after Confederation high school comprised four forms, divided between Lower School (Forms 1-2) and Upper School (Forms 3-4). Students were required to pass the "intermediate" exams in order to be admitted to Upper School. Junior Matriculation was at the end of Form 3 (the first year of Upper School) and Senior Matriculation was at the end of Form 4 (the second year of Upper School). Junior matriculants were able to gain admission to the first year of university and senior matriculants to the second year of university. In this phase of its history Ontario had both a three-year high school program (preparatory towards four years of university) and a four-year high school program (preparatory towards a three-year degree).[3]

The evolution of the secondary school system, in the past as in the present, has been closely intertwined with developments at the university level. In the last decade of the nineteenth century Ontario universities had developed the honours B.A. program, and Junior Matriculation with honours was required in some subjects for admission to this honours degree program. During this period the Junior Matriculation was split into two parts: part I (for which there was one exam) and part II (for which both honours and pass papers were set). Both parts I and II were to be written at different times, and this gave rise to the Middle School (to which Part I was assigned). Part II and Senior Matriculation were assigned to the Upper School. Thus, by 1913 Ontario's high school system had evolved into a three-tier system - Lower, Middle, and Upper School, each two years in length.[4]

The five-year high school that materialized after 1921 appeared to have been generally accepted by the public and educators at both the secondary and tertiary levels. Throughout the 1920s Ontario universities continued to admit both junior and senior matriculants into the first and second years of university respectively. But, in 1930, the University of Toronto decided that it would no longer offer the first year of the four-year B.A., which up to that time paralleled the Upper School course. This change in policy reinforced the role of Grade 13 as a university preparatory year.[5] Thus, the University of Toronto B.A. became a three-year general B.A. or a four-year honours B.A. after Senior Matriculation. Other Ontario universities followed this practice, and by the mid-fifties graduation from Grade 13 was typically the general requirement for admission to universities within the province.[6]

Despite the formalization of the thirteen-year school system in 1921, it was still regarded by many as unreasonable to expect every pupil to take that long between entrance to Grade 1 and graduation from Grade 13. Thus, in numerous schools the brighter students were encouraged to skip at least one grade, particularly in the primary school, a practice that had become quite widespread in the larger school systems by the end of the fifties. However, as Fleming reminds us, at the secondary school level, students were permitted to cover the program in less than five years only in unusual circumstances.[7] At the present time, with the credit system and the development of semestered schools, the completion of secondary school programs in less than five years has become more prevalent, but the percentage of graduates who do so does not likely exceed 20 per cent.[8]

During the 1950s and 1960s the issue of compressing the five-year high school system in Ontario to a four-year system was revived. The Hope Commission proposed to restructure the educational system to include six elementary grades, four secondary grades, and three years of junior college; the second year of junior college was equated with Grade 13 and the third year with first-year university.[9] One of the study groups of the Ontario Conference on Education in 1961 observed that other provinces and countries had only four years of high school and suggested that Grade 13 be abolished and the years preceding it strengthened.[10] In the same year a committee of the University Matriculation Board, chaired by President G. E. Hall of the University of Western Ontario and composed of several representatives from the university community, urged that much more work be given in Grades 9, 10,

and 11 so that the existing thirteen-year program could be covered in twelve years. The implication was that a great deal of time was wasted in the junior grades. The committee suggested that a uniform external-examination system would establish Grade 12 as the effective end of secondary education, with Grade 13 becoming a superior year of pre-university education and with students studying only four subjects in great depth.[11]

Similarly, in 1963, the Ontario Educational Association passed a resolution at its annual convention calling for a reduction in the length of the school program from thirteen years to twelve. The change was to be effected by eliminating one year at the elementary level. The rationale was that a considerable proportion of pupils managed to cover the program in seven years, and it appeared quite feasible to make the necessary modifications to enable the majority to follow the same pattern.[12]

As a result of the activities and recommendations of these various interest groups in education during the early sixties, the Ministry of Education established, in 1964, the Grade 13 Study Committee, comprised of representatives of the Department of Education, the schools, the universities, and the school boards, to examine the issues relating to secondary education. One of several recommendations made by this committee was that secondary school should conclude at the end of Grade 12. A matriculation or pre-university year was also to be established beginning in 1966, in which students admitted to the program would study not more than four subjects, two at the general and two at the advanced level. However, the proposal for the establishment of the matriculation year was abandoned due to the opposition of university officials to the idea of courses being offered at two different levels. Instead, university-admission requirements were reduced from nine Grade 13 courses or papers to seven.

Despite the compromise, the issue of reducing the length of the secondary school program did not evaporate. Hope was renewed in 1967 when the senate of the University of Toronto passed a resolution, which was communicated to the Ontario Department of Education, stating that "the University of Toronto is generally favourable to the idea of a twelve grade school system, provided that the level of preparedness reached at the end of the new twelfth grade be equal to that presently reached at the end of the thirteenth grade. The University would further urge that as much compressing as possible take place in the lower grades and that there be no reduction in the number of years spent in secondary schools."[13] Implicit support for the University of Toronto position came over a year later, in June 1968, when the Minister of Education, William Davis, stated in the legislative assembly that it was not a question of dropping a grade but of restructuring the entire system. Somewhat cryptically, he commented that between 40 and 45 per cent of all students actually completed the thirteen-year program in twelve years.[14] The Hall-Dennis Report of 1968 also recommended that Grade 13 be absorbed into a Kindergarden to Grade 12 system. But, in spite of pressure from all these sources, no official move was made.[15]

It is evident from the foregoing that there was a general consensus throughout the 1960s, despite some differences in the proposals to shorten the thirteen-year program by the various groups within the educational community, that the work covered in the thirteen-year school system could be done in twelve years. The issue remained dormant throughout the 1970s, but has been resuscitated in the 1980s with the initiation of the Secondary Education Review Project (SERP) by the Ministry. But unlike the earlier decades when the OSSTF supported implicitly the various proposals for compression, that support can no longer be taken for granted in this era of declining secondary school enrolment, redundant staff, and a surplus of teachers graduating from the faculties of education. It is also debatable whether the universities will be as supportive of maintaining Grade 13, in view of the University of Toronto's contemplated move to place limitations on certain Grade 13 courses for the purpose of admission to its first-year programs.

Footnotes

1. Robin Harris, Quiet Evolution: A Study of the Educational System of Ontario (Toronto: University of Toronto Press, 1967).

2. Ibid, p. 50.

3. Ibid, p. 48.

4. Ibid, p. 50.

5. W.G. Fleming, Ontario's Educative Society: Schools, Pupils and Teachers, vol. III (Toronto: University of Toronto Press, 1971), p. 87.

6. Harris, op. cit., p. 50.

7. Fleming, op. cit., p. 70.

8. We have no comprehensive statistics on this phenomenon, but we have some relevant information from our studies completed over the past six years, particularly A.J.C. King et al, Semestering the Secondary School, (Toronto: OISE and OSSTF, 1975), p. 19; and A.J.C. King et al, Approaches to Semestering Secondary School Organization: Some Current Alternatives (Toronto: OISE, 1977), pp.262-63.

9. J.A. Hope, Report of the Royal Commission on Education in Ontario, 1950 (Toronto: King's Printer, 1950).

10. Ibid., p. 98.

11. Ibid., p. 98.

12. Ibid., p. 99.

13. Ibid., p. 102.

14. Ibid., p. 103.

15. E.M. Hall and L.A. Dennis, Living and Learning. The Report of the Provincial Committee on Aims and Objectives of Education in the Schools of Ontario, Toronto: Queen's Printer, 1968).

III. Research Design

The main purpose of this study is to compare the first-year-university achievement of students who have completed Grade 13 in Ontario with students who have completed Grade 12 or its equivalent in other provinces. One of the difficulties of the design was to identify a setting in which these comparisons could be made. The ideal setting would have had three characteristics: students who were equally representative of the various socio-economic categories, a large number of students from each province enrolled in each program, and no adjustments or accommodations on the part of the universities to take into account differences in the educational preparation of students from each province. Unfortunately, these optimum conditions were not present, and, as a result, the research design entailed a series of compromises.

Four Ontario universities were selected for study. Each of the four enrol a relatively large number of out-of-province students. Two universities from nearby provinces were also chosen in order to assess the preparation of Ontario students for study outside the province. This analysis was designed in order to estimate the adjustment difficulties faced by students from other provinces in Ontario universities, as well as that faced by Ontario students in out-of-province settings. An attempt was also made to develop a backdrop against which achievement comparisons could be made by analysing such factors as provincial curricula and organization. The research design consisted of seven parts:

- an analysis of the structure of the provincial education systems and their university-admission procedures;
- an analysis of student achievement in first-year-university programs in six universities by origin of student;
- an in-depth analysis of admission and accommodation procedures in the six universities;
- an analysis of first year-university average-mark distributions;
- an analysis of the social and emotional adjustment problems of first-year-university students in one university;
- a determination of the effects of student age at university entrance on achievement and on the educational system as a whole; and
- an assessment of secondary school curricula in English and mathematics by province.

Details on the data sources and research procedures used in the study are presented within the following subsections.

The Structure of Education in Canada

This part of the study was concerned with the similarities and differences in the structure of education from province to province and with admission procedures to the various provincial universities. Any differences found might help explain differences in student achievement at university. The characteristics of the various provincial school systems were obtained mainly from the Statistics Canada publication Education in Canada, 1980, the materials prepared for the Organization for Economic Cooperation and Development review of educational policy in Canada in 1975, and university calendars. The analysis of admission procedures by province draws heavily on a study conducted by Edward Sheffield.[1]

University Case Studies

This section contains two main components: accommodation procedures and first-year-university achievement. Admission procedures were analysed in order to determine whether the six universities made special adjustments to take into account differences in the preparation of students resulting from where they completed secondary school. University calendars and related materials were collected from each of the six universities. Information regarding admission procedures was taken from these sources and then elaborated on through interviews with admissions officers. The following were questions directed to the admissions officers: What differences exist in secondary school leaving marks of students coming from Ontario in comparison with students coming from other provinces? What are the strengths and weaknesses of students from other provinces in comparison to Ontario students? Are students from other provinces more or less likely to be placed in remedial programs or given advance credits? In two of the universities there was a sufficient enrolment of students from the United States to study the relative performance of American students.

This "accommodation" information was used to supplement the achievement data where appropriate (e.g., to explain why so many students from the Atlantic provinces came to university with high secondary school marks) and to obtain the universities' perspective on differences in achievement associated with a student's home province. In each of the six universities the average secondary school matriculation marks[2] of incoming students were obtained, where possible, along with their first-year-university marks. For most of the universities marks were classified by program (usually arts, science, commerce, and engineering). In order to obtain sufficient numbers of out-of-province students for meaningful analyses, it was decided to combine some of the provinces into regions as follows: Atlantic Canada, Quebec, Ontario, and Western Canada.

Two analyses based on different sets of assumptions were conducted. In the first analysis it was assumed that the students were equivalent in academic preparation at entry despite differences in marks, and first-year-university marks were compared without making special adjustments. For the second analysis it was necessary to assume that the assignment of matriculation marks is essentially equivalent from province to province (i.e., a 75 per cent in British Columbia is equivalent to a 75 per cent in New Brunswick and a 75 per cent in Quebec). In order to take into

account differences in incoming marks, a sample was selected from the Ontario population representing the same proportion of students in each mark range from the out-of-province group (i.e., if 4 per cent of the out-of-province students has a matriculation average of between 81 and 82 per cent, a 4 per cent sample of Ontario students in that mark range was selected). In order to make the Ontario representative sample sufficiently large to justify the statistical analysis, the Ontario sample chosen was two to five times as large as the out-of-province group, depending on the size of that group. Means and standard deviations were computed for the first-year group, and simple T-tests were conducted for the regional/provincial comparisons where the number of students in each group warranted this treatment. The data are presented in tabular form.

Achievement of the "Better" Students

A recent in-house study conducted by an Ontario university suggested that the best students from other provinces were not as successful as students from Ontario in achieving high marks. In order to determine where this pattern applied to the universities surveyed in this study, first-year-university mark distributions were analysed. The proportions of students who received an average of 80 per cent or more from each of the four Canadian regions were compared. These figures are presented in tabular form.

Social and Emotional Adjustment at University

It has been suggested that younger students from provinces outside Ontario are more likely to have difficulties adjusting to university than those who have the extra year of secondary school provided by Ontario. It is also possible that differences in secondary school programs from province to province might contribute to adjustment problems. This study could not look at the phenomenom of university adjustment in great detail, but it was possible to obtain student-services' information from one university. This information was classified into three types of services received by students: personal, vocational, and academic counselling. Students were classified into one of four geographic categories, and their use of the student-services resources was noted. The categories were as follows: from an area near the university; from within 240 km of the university; from within the province but over 240 km from the university; and from other provinces. A chi-square analysis was applied to the data, and it is presented in tabular form.

Age at Entry to University

It was not possible to obtain information regarding each student's age on entry to university from the six case-study universities, because this information is kept in a personal file separate from the marks information. To obtain this information would have increased the cost and time-lines of the study beyond the value of the information. However, using Statistics Canada data, the approximate age at university entry of students by province was examined in order to determine whether there were significant differences in the entry age of students from province to province. A relatively large proportion of Ontario's population from eighteen to twenty-four years of age is engaged in post-secondary education. Ontario figures

were compared with those of other provinces as a basis for assessing the effect of students' age at university entry on achievement and for estimating the effect on this age group with regard to attendance at school and participation in the world of work if Grade 13 were discontinued.

Secondary School Curriculum

If there were differences in achievement in the first year of university, it was assumed that they could be explained in part on the basis of the curriculum covered in secondary school; therefore, a small-scale study of provincial curricula in mathematics and English was conducted. Two curriculum specialists were invited to predict first-year-university achievement by region on the basis of curriculum differences. In order to make these predictions, specific information on curriculum offerings by province was obtained from the Council of Ministers of Education, Canada. When the achievement data were available, the curriculum specialists were asked to interpret the findings in terms of their predictions and knowledge of the provincial curricula.

Footnotes

1. Edward Sheffield, "Student Mobility No Simple Matter", University Affairs, August-September 1980.

2. The term matriculation marks in this study refers to the average marks obtained by students in the last year of pre-university school, whether it was Grade 13, Grade 12, or the first year of a CEGEP.

IV. The Findings

The Structure of Education in Canada

There is a common impression held by many Ontarians that the only difference between the school system of Ontario and the rest of Canada is that the final year of secondary school in Ontario is Grade 13, while in most other provinces it is Grade 12. It must be made clear at the outset that there are fundamental differences in the provincial organizations of education up to and including the universities. These differences reflect each province's attempts to respond to its own educational concerns. The suggestion that if Grade 13 is dropped Ontario's educational system will be similar to those in the rest of North America is simply not true.

This subsection provides specific information on the organization of each province's educational system. The university systems are shown to be directly related to the secondary school systems from which they draw their primary clients; as a result provincial universities must develop specialized admission procedures to deal with students from other provinces. The most common practices in the United States are also discussed. The analysis includes only two university programs--engineering and arts. The non-university, post-secondary school education programs are not included in the discussion, although their diversity from province to province only adds further evidence of variability. The university-admission procedures within each province and for students moving from one province to another are then presented.

Characteristics of Provincial School Systems

Figure 1 depicts the structure of education in the ten Canadian provinces and the United States up to the point of completion of a first degree in arts or engineering. Perhaps the most obvious point to be drawn from figure 1 is the fact that students graduating from high school take a differing number of years to achieve technically the same goal; that is, students from Ontario and Quebec are required to complete thirteen years of schooling before they are eligible for university entrance in their province; students from Newfoundland are required to complete only eleven years of schooling; students from all other provinces are required to complete twelve years of schooling.

Figure 1 also depicts wide variation with regard to the organization within each structure prior to university. A student from Alberta begins junior secondary school in Grade 7; in Ontario that student would still be considered to be in elementary school. While there is uniformity of structure among Alberta, New Brunswick, Nova Scotia, and Prince Edward Island, the remaining provinces have gone their own ways. In the province of Quebec, for example, secondary school begins with Grade 7 (and the grades are referred to as Secondary 1, Secondary 2, Secondary 3, etc.) and ends after Grade or Year 11; the twelfth and thirteenth years of schooling are taken in the CEGEPs.

In six provinces a Bachelor of Arts degree can be obtained in three years, while in four provinces and the United States four years are required. The common pattern for an engineering degree is four years, but Prince Edward Island, British Columbia, and Quebec are exceptions.

While it is true that the absorption of Grade 13 would give the appearance that Ontario had a structure similar to most other provinces from Kindergarten to Grade 12, certain fundamental curriculum and organizational differences would still remain. A Kindergarten to Grade 12 system in Ontario would also focus attention on the question of whether three or four years should be required for a first degree in arts. There is already some discussion taking place among university officials in Ontario about the possibility of requiring four years for the first arts degree.

University-Admission Requirements

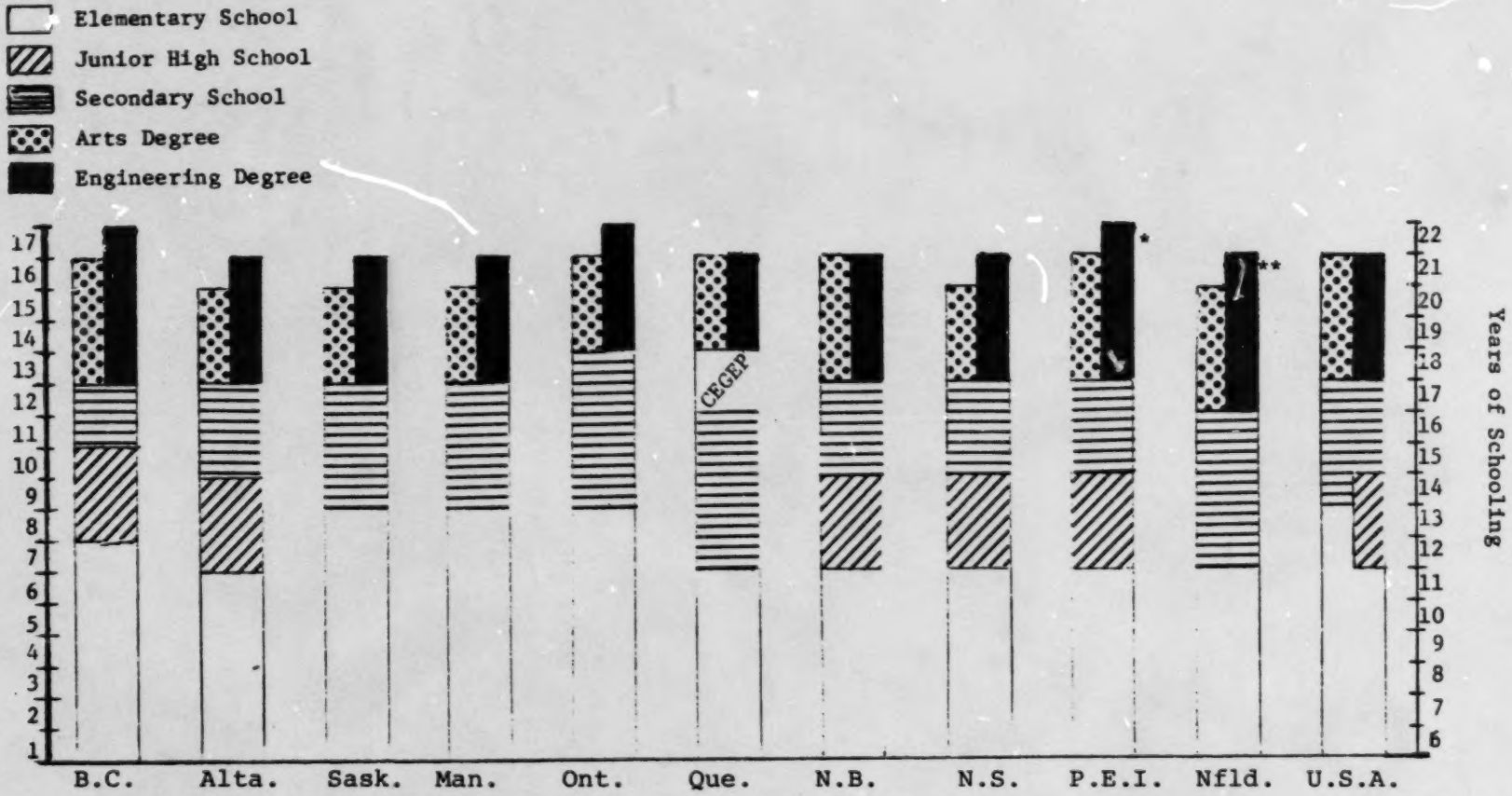
The admission requirements of the provincial universities reflect each university's perception of the relative quality of the graduates from each province. This section examines the minimum admission standards for both home-province students and out-of-province students.

We begin by examining adjustments made by individual institutions to accept out-of-province students to determine where it is to a student's advantage to move out of the province in order to finish a degree a year earlier. Detailed study in this area has been done by Edward Sheffied of the University of Toronto, and table 1 has been adapted from his work.[1]

The table is divided into two main sections to account for the two major bachelor's-degree course patterns available throughout Canadian universities: that is, the three-year or four-year requirement to attaining a general bachelor's degree in arts or science. From the table it can be seen that, in the provinces of Newfoundland, Prince Edward Island, New Brunswick, and British Columbia (the universities cited represent the typical patterns in their provinces), students accepted to the institutions named usually finish a bachelor's degree in four years. In the second grouping of provincial universities students admitted to these institutions typically take three years to finish a bachelor's degree.

The boxes within cells in the table indicate how, in each province, the provincial university, or a prominent university, sets admission standards for home-province students. The other cells in the rows, reading from left to right, show what qualifications from students from other provinces each university treats as equivalent to its local requirement. For example, the University of Manitoba admits students to a three-year degree program on the basis of twelve years of schooling (S12) in Manitoba. Qualifications from other provinces deemed to be equivalent are eleven years of schooling plus one year of university (S11 + U1) in Newfoundland, eleven years of schooling plus the first year of a CEGEP (S11 + C1) in Quebec, or thirteen years of schooling in Ontario.

Figure 1: Organization of Education in the Ten Provinces and the United States



* An engineering degree requires three years at the University of Prince Edward Island and two years at the University of New Brunswick.

** The engineering degree is earned through a five year co-operative program.

Sources: Statistics Canada, Education in Canada, 1980 and university calendars.

Table 1: University-Admission Requirements for Students From Within and From Outside of Each of the Ten Provinces

	Province / University	NFLD.	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.
Four-Year Arts or Science	Memorial U. (Nfld.)	S11	S12	S11	S12	S11 / -1	S12	S11	S11	S11	S12
	U. of P.E.I.	S11	S12	S12 / +1	S12	S11 / -1	S12	S12 / +1	S12 / +1	S12 / +1	S12
	U. of N.B.	S11	S12	S12 / +1	S12	S11 / -1	S12	S12 / +1	S12 / +1	S12 / +1	S12
	U. of B.C.	S11 + U1 / +1	S12	S12 / +1	S12	S11 + C2	S13 / +1	S12 / +1	S12 / +1	S12 / +1	S12
Three Year Arts or Science Degree	Dalhousie U.	S11 + U1	S12 / -1	S12	S12 / -1	S11 + C2	S13	S12	S12	S12	S12 / -1
	McGill U.	S11 + U1	S12 + U1	S12 + U1 / +1	S12 + U1	S11 + C2	S13	S12 + U1 / +1	S12 + U1 / +1	S12 + U1 / +1	S12 + U1
	U. of Toronto	S11 + U1	S12 + U1	S12	S12 / -1	S11 + C1 / -1	S13	S12	S12	S12	S12 / -1
	U. of Manitoba	S11 + U1	S12 / -1	S12	S12 / -1	S11 + C1 / -1	S13	S12	S12	S12	S12 / -1
	U. of Saskatchewan	S11 + U1	S12 / -1	S12	S12 / -1	S11 + C1 / -1	S13	S12	S12	S12	S12 / -1
	U. of Alberta	S11 + U1	S12 / -1	S12	S12 / -1	S11 + C1 / -1	S13	S12	S12	S12	S12 / -1

Legend: S - Secondary school grade
C - CEGEP year
U - University year

If +1 - A student from the province named at the top of this column, entering the university named at the left of this row, would require one year more for a bachelor's degree in the general course in arts or science than if he/she entered university in his/her home province.

If -1 - A student from the province named at the top of this column, entering the university named at the left of this row, would require one year less for a bachelor's degree in the general course in arts or science than if he/she entered university in his/her home province.

Sources: Adapted from Edward Sheffield, "Student Mobility No Simple Matter" University Affairs. August-September 1980.

It can also be seen that a student can gain or lose a year depending on which university (province) he/she attends. For example, a student graduating from a Nova Scotia secondary school (S12) would take the same amount of time to complete a bachelor of arts degree in five other provinces as he/she would at home, but would require an extra year of schooling if he/she were to offer his/her Nova Scotia qualifications to universities in Prince Edward Island, New Brunswick, British Columbia, or Quebec. In his/her own province a Quebec student would qualify for a general bachelor's degree in three years after the second year of a university preparatory course in a CEGEP (S11 + C2); in universities in the other provinces, with the exception of British Columbia and Dalhousie University in Nova Scotia, he/she would be admitted to a three-year degree course after the first CEGEP year (S11 + C1).

As Sheffield concludes, there is no provincial pre-university certificate that is treated in the same way by universities in all provinces. Nor does any one of the ten universities listed in table 1 regard the qualifications of entrants from all provinces as they are regarded in their home provinces.

Case-Study Universities: Accommodations and Achievement

This part of the report examines, in some detail, the adjustments made in the six case-study universities to take into account differences in background preparation associated with the various provincial curricula. Those adjustments made to reconcile perceived deficiencies or extra qualifications among students (e.g., required remedial courses, advanced standing) are particularly examined. It is quite conceivable that these explicit and implicit adjustments are sufficient to overcome basic differences in preparation and can consequently lead to similar levels of achievement among students in the first year of university. This is considered as one of the factors in the comparative analysis of the first-year-university achievement of students from the various provinces. Each university is analysed separately in terms of accommodation procedures and student achievement; then common patterns among all of the institutions are noted.

University A

Admissions/accommodations. University A offers graduate and undergraduate programs in arts, science, commerce, and engineering, among other programs. A three-year general B.A., a four-year B.A., and a four-year B.Sc. are all offered. Students in the four-year program can take a major, a combination of majors, or an honours degree in their chosen fields. Although the three-year general B.A. is offered, most students in the arts program take a four-year degree. Indeed, it would appear that the three-year program is in the process of being phased out, as enrolment in this program has been declining substantially in recent years.

Minimum admission requirements are summarized in table 2. Ontario Grade 13 students are admitted on a par with high school graduates from other provinces: they receive no advanced standing and no extra credits.

Table 2: Minimum Admission Requirements by Province/United States - University A

Province/United States	Minimum Admission Requirements
Ontario	Grade 13
British Columbia, Yukon, Alberta, Northwest Territories, Saskatchewan, Manitoba, New Brunswick Nova Scotia	Grade 12
Quebec	One year in a CEGEP or Grade 12 from a private school
Prince Edward Island	First-year standing at the University of Prince Edward Island (30 semester hours)
Newfoundland	Junior Division at Memorial University or Grade 12 at Labrador City Collegiate
United States	Grade 12 plus SAT* scores

*Scholastic Aptitude and Achievement Tests

Applicants must present an overall average of at least ten percentage points higher than the minimum passing grade in their educational system. In Quebec, for example, the passing grade is 60 per cent; applicants must therefore have a minimum of 70 per cent. Ontario applicants must have a 60 per cent average, as the provincial passing grade is 50 per cent. The rationale behind this requirement is not to account for perceived weaknesses or strengths, but, rather, to attempt to draw on the academically strongest group of students across the country.

Because of the strong academic reputation of this university, it tends to draw students with higher standing than the minimum levels stated above, and specific admission requirements may vary from year to year. Admission requirements also vary slightly according to the course of study to be followed. These variations are outlined in table 3.

Marks requirements may vary depending on the province of origin, as mentioned earlier; they may also vary from one faculty to another. Information provided by the admissions officer of University A indicated that the following variations exist: Engineering students typically enter with an average in the low to mid-seventies; commerce entrants typically have an average in the low eighties; honours science students are accepted from the high sixties; and bachelor of arts students are accepted from the mid- to high sixties.

The admissions officer of University A was also asked to comment on the relative performance in first-year university of Ontario and out-of-province students. It was reported that "in general, out-of-province Grade 12 students tend to have more problems with mathematics--the Grade 13 students have had a sounder preparation". First-year CEGEP students were perceived as "well-prepared". The admissions officer, aside from his earlier remarks about mathematics, concluded as follows: "Quebec, Ontario, Manitoba, Alberta, and British Columbia students are on a par--the same calibre of students". The performance of Atlantic Canadian students was reported as "spotty". In spite of the fact that some variation was perceived in the academic ability of incoming students from various regions, University A offers no remedial courses for poor students, nor does it offer advanced credits for strong students.

University A accepts students from the United States with Grade 12 standing from their state of origin plus high scores on the Scholastic Aptitude and Achievement Tests of the College Entrance Examination Board (SAT tests) A letter of recommendation from the principal of the applicant's school is also required. Here again, University A looks very closely at the applicant's marks. The admissions officer reported that while there was some difficulty in equating marks from American school systems with those from the Ontario system, University A expects "substantially A's" from an American student and that he/she is in the "top 20 per cent" of the class. SAT scores greater than 500 are expected, because "if they have less than 500, they tend to get into difficulty" once accepted. This particular score is achieved by the top 27 per cent in the verbal component of SAT and the top 41 per cent in the mathematical component of SAT of college-bound seniors in the United States.

Table 3: Program-Admission Requirements - University A

Program	Requirements
Honours Bachelor of Science	Three credits from algebra, calculus, relations and functions, chemistry, and physics
Commerce	Two credits in mathematics (chosen from calculus, algebra, and relations and functions) and one credit in English
Engineering*	Three credits in mathematics (relations and functions, algebra, and calculus); one credit in chemistry; and one credit in physics
Bachelor of Arts	No subject requirements for admission, although students planning concentrations in languages, computing and information, mathematics, or natural sciences should have prepared themselves in their secondary programs for the appropriate first-year university courses in these subjects

*Admission is based on a comprehensive evaluation of the student rather than on the student's academic record alone; applicants are invited to submit any information that they feel would be helpful in making admission decisions.

Academic Achievement. Table 4 shows the distribution of the matriculation or final-year average marks in high school (or equivalent in the case of Quebec) of students who subsequently completed a full year of university or at least four university credits in the first year of university after entrance in the years 1977-79. For all four programs it is evident that the average matriculation mark of the Ontario student was lower than that of his/her peers from the other regions. Thus, it is evident from the table that, in the admission of students from outside of the Ontario school system, there is a selection bias that favours the out-of-province-student with higher matriculation marks.

Despite the bias in selection, there is considerable variation between the groups of entrants within the program areas. The matriculation marks of the Quebec entrants in the arts program vary the least and those of Western Canada the most; those of the Ontario and Atlantic Canada entrants are in the intermediate range. In contrast, Ontario entrants in the science program evince the most variation with respect to incoming or matriculation marks and Quebec the least; Western and Atlantic students are in the intermediate range. Among commerce entrants, Ontario students show the least variation and Quebec the most; the students from Atlantic Canada and the West are in the intermediate range although their numbers are smaller.

In engineering, as in Science, Quebec students show the least and Ontario students the most variability with respect to matriculation marks. On the whole, table 4 suggests that students from Quebec are the most-homogeneous group of entrants in arts, science, and engineering, and Ontario the most homogeneous in commerce. (Entrants from Quebec are English-speaking students who have completed one year of CEGEP or the Grade 12 graduates of private schools such as Lower Canada College.)

Table 5 shows the average matriculation marks, first-year-university marks, and the difference or mark-drop by program areas of incoming students. The mark change for American students is not shown, because their marks could not be translated into equivalent percentages due to the variety of bases used. Some American schools employed a four-point system, some a six-point, others an eight-point, and still others a ten-point base for assigning final-year high school averages. However, while comparable matriculation marks are not available, the interviews with the admissions officer of university A revealed that American students required a minimum score of 500 on the verbal and the mathematical Scholastic Aptitude Tests (SAT).

Table 5 is designed to illustrate the dramatic drop in marks between secondary school and the first year of university for most students. At University A this drop is especially pronounced, particularly for students from Atlantic Canada. The drop is least for students from Ontario and Quebec.

Table 4: Matriculation Marks* of Entrants-University A, 1977, 1978, 1979

Program/Region	Mean	Standard Deviation	Number of Students
Arts			
Ontario	74.83	6.36	1874
Western Canada	79.93	7.01	115
Quebec	77.65	4.67	138
Atlantic Canada	82.80	6.88	25
Science			
Ontario	79.43	7.06	1175
Western Canada	83.42	6.90	81
Quebec	80.86	5.02	57
Atlantic Canada	85.16	6.74	30
Commerce			
Ontario	80.23	4.71	468
Western Canada	84.41	5.10	19
Quebec	82.16	5.30	47
Atlantic Canada	84.51	5.00	7
Engineering			
Ontario	81.22	6.31	848
Western Canada	85.07	5.95	57
Quebec	82.08	5.37	54
Atlantic Canada	85.54	5.73	9

* The term matriculation marks in this study refers to the average marks obtained by students in the last year of pre-university school, whether it be Grade 13, Grade 12 or first year CEGEP.

Table 5: Matriculation and First-Year University Averages - University A, 1977, 1978, 1979

Program/Region	Matriculaton Marks	First Year Average	Difference	Number of Students
Arts				
Ontario	74.83	66.65	- 8.18	1874
Western Canada	79.93	67.91	-12.02	115
Quebec	77.65	66.39	-11.26	138
Atlantic Canada	82.80	68.81	-13.99	25
United States	-	67.90	-	40
Science				
Ontario	79.43	68.10	-11.33	1175
Western Canada	83.42	71.94	-11.48	81
Quebec	80.86	72.07	- 8.79	57
Atlantic Canada	85.16	68.77	-16.39	30
United States	-	63.82	-	17
Commerce				
Ontario	80.23	71.51	- 8.72	468
Western Canada	84.41	72.73	-11.68	19
Quebec	82.16	72.55	- 9.61	47
Atlantic Canada	84.51	73.97	-10.54	7
United States	-	68.00	-	4
Engineering				
Ontaric	81.22	63.39	-17.83	848
Western Canada	85.07	66.34	-18.73	57
Quebec	82.08	69.57	-12.51	54
Atlantic Canada	85.54	65.11	-20.43	9
United States	-	56.53	-	15

Table 6: First-Year-University Marks of Entrants - University A, 1978, 1979, 1980

Program/Region	Mean	Standard Deviation	Number of Students
Arts			
Ontario	66.65	8.43	1874
Western Canada	67.91	8.82	115
Quebec	66.39	8.61	138
Atlantic Canada	68.81	7.76	25
United States	67.90	7.76	40
Science			
Ontario	68.10	11.61	1175
Western Canada	71.94	10.04	81
Quebec	72.07	9.48	57
Atlantic Canada	68.77	10.61	30
United States	63.82	14.07	17
Commerce			
Ontario	71.51	7.01	468
Western Canada	72.73	8.04	19
Quebec	72.55	9.06	47
Atlantic Canada	73.97	6.84	7
United States	68.00	12.19	4
Engineering			
Ontario	63.39	11.31	848
Western Canada	66.34	11.43	57
Quebec	69.58	10.86	54
Atlantic Canada	65.11	14.42	9
United States	56.53	11.09	15

Table 7: Comparisons by Region and Program of Unadjusted First Year Marks - University A, 1978, 1979, 1980

Program/Region	Mean	Standard Deviation	Number of Students	Significance* of Difference
Arts				
Ontario	66.65	8.43	1874	N.S.
Western Canada	67.91	8.82	115	
Ontario	66.65	8.43	1874	N.S.
Quebec	66.39	8.61	138	
Ontario	66.65	8.43	1874	N.S.
Atlantic Canada	68.81	7.76	25	
Science				
Ontario	68.10	11.61	1175	0.01
Western Canada	71.94	10.04	81	
Ontario	68.10	11.61	1175	0.01
Quebec	72.07	9.48	57	
Ontario	68.10	11.61	1175	N.S.
Atlantic Canada	68.77	10.61	30	
Commerce				
Ontario	71.51	7.01	469	N.S.
Western Canada	72.73	8.04	19	
Ontario	71.51	7.01	469	N.S.
Quebec	72.54	9.06	47	
Ontario	71.51	7.01	469	—
Atlantic Canada	73.97	6.84	7	
Engineering				
Ontario	63.39	11.31	848	0.10
Western Canada	66.34	11.43	57	
Ontario	63.39	11.31	848	0.01
Quebec	69.57	10.86	54	
Ontario	63.39	11.31	848	—
Atlantic Canada	65.11	14.42	9	

*A simple T-test was used for this statistical analysis.

If we assume that the students who come to University A are similar to Ontario students in all respects but for differences associated with the educational system from which they came, then we can associate any differences in achievement in the first year of university with educational background. This assumption is questionable for a number of reasons but, nevertheless, let us analyse the university achievement data with that assumption. Table 6 presents first-year marks at University A by program area and regional area of the students. The numbers in some of these categories are too small for meaningful analysis, and table 7 presents a statistical analysis of the difference between the means (T-test) of those groups with numbers of nineteen or greater. No significant differences were found in the arts comparisons, although the marks of Atlantic Canadians were approximately two points above the average. Both Quebec and Western Canadian students achieved significantly higher than Ontario students in science ($P<.01$), but there was no difference between students from Ontario and Atlantic Canada.

There were no significant differences found in the commerce comparisons. Western Canadian students achieved slightly higher marks than Ontario students in engineering, and Quebec students achieved a full six marks higher on average than Ontario students. Analyses were not done for American students because of small numbers, but, interestingly, in spite of the high admission standards for these students, they achieved at a lower level than all groups in every area except arts. (See table 6.)

As indicated earlier, a selection bias is evident in the admission of out-of-province students in University A in terms of high school matriculation marks. Thus, in comparing the average marks of all Ontario students with the upper-echelon, out-of-province entrants in the four program areas of first-year university, there is a danger that we are comparing dissimilar groups. We have attempted to make the groups more comparable: for each program area we have randomly selected a group of Ontario entrants (three to four times as large as the out-of-province entrants) with the same matriculation-marks distribution as the out-of-province entrants. Hence, table 8 presents an "adjusted" marks analysis of first-year marks, which is based on the marks of Ontario and out-of-province students grouped within equivalent matriculation-marks ranges. The assumption on which this analysis is based is that the assignment of marks is done in essentially the same way from province to province. (We realize that this is also a questionable assumption).

As table 8 indicates, the average first-year mark of Ontario students in arts is between three and four marks higher than the average of the three groups of out-of-province students and is statistically significant. In science there were no significant differences found in the Ontario/Quebec and Ontario/Western Canada comparisons, but Ontario students did achieve significantly higher than students from Atlantic Canada. In commerce there were no significant differences found, but in engineering a significant difference was found favouring Quebec students over those from Ontario.

In summary, this adjusted marks analysis shows Ontario students achieving better in the arts and Quebec students achieving better in engineering.

Table 8: Comparisons by Region and Program of Adjusted First-Year Marks* - University A, 1978, 1979, 1980

Program/Region	Mean	Standard Deviation	Number of Students	Significance** of difference
Arts				
Ontario	71.52	7.48	345	0.01
Western Canada	67.91	8.82	115	
Ontario	69.35	6.49	552	0.01
Quebec	66.39	8.61	138	
Ontario	72.51	7.55	100	0.05
Atlantic Canada	68.81	7.76	25	
Science				
Ontario	73.09	11.97	324	N.S.
Western Canada	71.94	10.04	81	
Ontario	70.18	10.36	228	N.S.
Quebec	72.07	9.48	57	
Ontario	74.29	10.39	120	0.01
Atlantic Canada	68.77	10.61	30	
Commerce				
Ontario	75.30	6.47	76	N.S.
Western Canada	72.31	8.04	19	
Ontario	72.96	7.19	188	N.S.
Quebec	72.54	9.06	47	
Engineering				
Ontario	68.30	11.58	228	N.S.
Western Canada	66.34	11.43	57	
Ontario	64.13	11.25	216	0.01
Quebec	69.57	10.86	54	

*In this adjusted marks analysis, a sample of Ontario students was drawn from each incoming average mark range (e.g., 86+, 85-86, 83-84, etc.) in proportion to the percentage of out-of-province students falling in that mark range.

** A simple T-test was used for this statistical analysis.

On the whole, Ontario entrants with matriculation averages similar to out-of-province students either do as well as or better than the latter group in arts, science and commerce. Only in engineering does the pattern change, with Ontario students doing as well as or better than the Western Canadian students, but less well than the students from Quebec.

University B

Admissions/accomodations. University B is rich in tradition and counts among its graduates many eminent public figures. Graduate and undergraduate degrees are offered in arts, science, and engineering.

An applicant for admission to either program must have completed high school graduation at a level satisfactory to University B, with credits acceptable for admission to a university in the province in which the student is completing his/her secondary education (except for Quebec, Prince Edward Island, and Newfoundland). As with University A, University B does not award extra credits or advanced standing to Ontario Grade 13 students.

Table 9 summarizes the admission requirements for University B.

Table 9: Minimum Admission Requirements by Province - University B

Province	Minimum Admission Requirements
Ontario	Grade 13
Quebec	CEGEP I or the equivalent
British Columbia, Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia,	Grade 12
Prince Edward Island, Newfoundland	First-year university or equivalent

Specific course requirements for admission to University B are outlined for the arts, science, and engineering streams. As might be expected, arts candidates are required to demonstrate a broad spectrum of courses, perhaps with more emphasis on mathematics and sciences than is often specified in other universities.

Course requirements for applicants to science and engineering from specific provinces are clearly spelled out. The admissions officer interviewed pointed out that the very specific requirements from province to province is to ensure that all candidates start on the same basis. An applicant to science and engineering from provinces outside of Ontario must have standing, therefore, in the following subjects and areas:

- One course in English or Anglais, or French or français;

- a) for applicants from Ontario, additional courses including relations and functions, calculus, and two or three of algebra, physics, and chemistry;

  b) for applicants from Quebec, five courses from CEGEP I in mathematics, physics, and chemistry, including Physics 101, Chemistry 101, and at least two courses chosen from Mathematics 101, 102, 105, and 203;

  c) for applicants from Alberta, four additional courses including Mathematics 30 and two or three of Mathematics 31, Physics 30, and Chemistry 30;

  d) for applicants from Nova Scotia, five additional courses including algebra, trigonometry, geometry, and one or two of physics and chemistry;

  e) for applicants from other provinces, three additional courses including mathematics and one or two of physics and chemistry; and

- any other approved subject (or subjects) to make up the full requirements of the appropriate provincial graduation certificate.

Academic Achievement. Table 10 shows the distribution of the matriculation or final-year average marks in high school and the first year of a CEGEP, in the case of Quebec, for all entrants for whom marks were available (excluding a small number of mature students) for the years 1976-79. Students from Atlantic Canada entered with the highest matriculation standing followed by those from Western Canada, Quebec, and Ontario. Thus, the rank order of entrants in University B is the same as in University A. Like the latter, a selection bias in favour of non-Ontarians with higher matriculation averages is evident in University B.

Table 10: Matriculation Marks* of Entrants - University B , 1976, 1977, 1978, 1979

Region Of Entrants	Mean	Student Deviation	Total Number
Ontario	76.52	8.04	269
Western Canada	78.64	7.25	42
Quebec	76.85	7.28	138
Atlantic Canada	85.91	5.63	25

*The term matriculation marks in this study refers to the average marks obtained by students in the last year of pre-university school, whether it be Grade 13, Grade 12, or the first year of a CEGEP.

The data also reveals some variations in the spread or dispersion of the matriculation averages of the incoming groups. Atlantic Canada is the most and Ontario the least homogeneous of the four groups, with Western Canada and Quebec almost identical in terms of their standard deviations.

Table 11 shows both the average matriculation and average first-year university marks, as well as the corresponding difference or mark-drop for the four groups. The Quebec students, on average, do the best of the four groups in terms of first-year academic achievement, followed by Ontario, Atlantic Canada, and Western Canada. However, the latter group does relatively better than Atlantic Canada, which shows the biggest mark-drop of the four. Quebec, on the other hand, shows the best relative performance followed by Ontario. For the four groups as a whole, average matriculation marks do not appear to be a very reliable guide for predicting first-year academic achievement of entrants to University B.

Table 11: Matriculation and First-Year-University Averages - University B, 1976, 1977, 1978, 1979

Region of Entrants	Matriculation Marks	First Year Average	Difference
Ontario	76.52	66.82	- 9.70
Western Canada	78.64	61.41	-17.23
Quebec	76.85	69.70	- 7.15
Atlantic Canada	85.91	65.58	-20.43

Table 12 shows the first-year average marks and standard deviations for the incoming students in the common-year program at University B. As a group, the Quebec students have the best average (almost 70 per cent), followed by Ontario (nearly 67 per cent) and Atlantic Canada (approximately 66 per cent). Western Canada has the lowest average (61 per cent) of the four groups, combined with the least variation in the dispersion of individual marks as attested to by its standard deviation. Atlantic Canada evinces the most variation in marks distribution with Quebec and Ontario in the intermediate range. Of the latter two, Quebec shows the greater homogeneity in mark distribution.

Table 12: First-Year-University Marks of Entrants - University B, 1976, 1977, 1978, 1979

Region Of Entrants	First Year Average	Standard Deviation	Total Number
Ontario	66.82	9.52	269
Western Canada	61.41	8.41	42
Quebec	69.70	8.95	138
Atlantic Canada	65.58	9.81	25

Table 13: Comparisons by Region of Unadjusted First Year Marks - University B, 1976, 1977, 1978, 1979

Region	Mean	Standard Deviation	Number of Students	Significance* of Difference
Ontario	66.82	9.52	269	.01
Western Canada	61.41	8.41	42	
Ontario	66.82	9.52	269	.01
Quebec	69.70	8.95	138	
Ontario	66.82	9.52	269	N.S
Atlantic Canada	65.58	9.81	25	

*A simple T-test was used for this statistical analysis.

Table 14: Comparisons by Region of Adjusted First-Year Marks* - University B, 1976, 1977, 1978, 1979

Region	Mean	Standard Deviation	Number of Students	Significance** of Difference
Ontario	69.29	9.10	126	.01
Western Canada	61.41	8.41	42	
Ontario	67.36	9.61	138	.05
Quebec	69.70	8.95	138	
Ontario	73.88	9.18	50	.01
Atlantic Canada	65.58	9.81	25	

*In this adjusted marks analysis, a sample of Ontario students was drawn from each incoming average mark range (e.g., 86+, 85-86, 83-84, etc.) in proportion to the percentage of out-of-province students falling in that mark range.

**A simple T-test was used for this statistical analysis.

The list of differences between the unadjusted means shown in table 13 indicate that Ontario students achieved significantly higher than students from Western Canada. However, students from Quebec achieved significantly higher than Ontario students. When the data were adjusted to take into account the differences in matriculation marks (table 14), Ontario's advantage over Western Canada was maintained and, as well, a significant difference was found favouring Ontario over Atlantic Canada. Quebec's advantage over Ontario was maintained, but the mean difference was less.

University C

Admissions/accommodations. University C is one of the larger Ontario universities with a long tradition of solid academic achievement. High school graduation is the basic admission requirement. Ontario students seeking admission need at least six approved Grade 13 credits with a minimum final average of 60 per cent. Students from provinces other than Ontario are eligible for admission on the basis of Senior Matriculation with minimum mark requirements varying from province to province. Table 15 summarizes the minimum admission requirements.

The admission marks differential by province indicates a perception held by officials of University C regarding differences in the quality of university preparation from province to province. These minimum admission standards are based on experience and some knowledge of each province's curricula, but they are not based on extensive statistical analysis.

Table 15: Minimum Admission Requirements by Province/United States - University C

Province/United States	Academic Level	Academic Standard
Alberta	Grade 12	65%
British Columbia	Grade 12	75%
Manitoba	Grade 12	65%
New Brunswick	Grade 12	75%
Newfoundland	Grade 11 plus one year at Memorial University	65%
Nova Scotia	Grade 12	75%
Prince Edward Island	Grade 12 plus one year at the University of Prince Edward Island	65%
Quebec	Grade 12 or the first year at a CEGEP	65%
Saskatchewan	Grade 12	70%
United States	Grade 12	A average or top 10 - 15% of class

Beyond the basic admission requirements, there was no evidence of special treatment of students from other provinces in the form of required remedial courses of advances credits offered.

Academic Achievement. A full range of matriculation marks was not available for students attending University C, but two analyses of first-year achievement were feasible. The first of these analyses was based on the first-year marks by program and region of those students who completed the school year with no failed courses (table 16). The second analysis focused on the proportion of students by program and region who failed one or more courses or who withdrew before completing the year (table 17).

T-tests were applied to the regional comparisons when the number of students was eighteen or greater. From table 16 it can be seen that the marks by region of origin of students are remarkably similar from program to program. The only exception is in science where Ontario students achieved slightly higher than students from Quebec. The variable minimum admission mark by province appears to be having the desired effect of balancing university achievement.

The number of students from the Atlantic provinces shown in table 17 is really too small for useful analysis, but some of the other findings presented in the table are quite relevant. Students from Quebec are slightly more likely to have failed courses, followed by students from Western Canada and then Ontario. Students from Western Canada are slightly more likely to withdraw. In the two areas where there were sufficient students for a comparison between Ontario and Quebec, Ontario students were more likely to fail in science and Quebec students more likely to fail in the social sciences. In these same two program areas, Western Canadian students were slightly less successful than Ontario students, but the differences were quite small.

Overall, regional differences in first-year achievement at University C by source of students were quite small, perhaps reflecting the refined admission procedures.

University D

Admissions/Accommodations. University D provides considerable flexibility in its admission requirements. The individual academic qualifications of applicants are reviewed, and the applicants may be admitted on that basis either to a "qualifying year" or to the "first year". Where a student is admitted at the qualifying-year level, a major-degree program is normally four years and an honours-degree program is normally five years in length. Where a student is admitted at the first-year level, the degree program is reduced by one year.

To be considered for admission to the first-year level at University D, an Ontario student must successfully complete Grade 13. Minimum admission marks vary according to the program applied to: the minimum average for arts is 60 per cent, for engineering 70 per cent, for commerce 72 per cent, and for science 60 per cent with an average in core science and mathematics subjects higher than the overall average.

Table 16: Comparisons by Region and Programs of Unadjusted First-Year Marks - University C, 1977, 1978, 1979

Program/Region	Mean	Standard Deviation	Number of Students	Significance* of Difference
ARTS				
Ontario	72.2	6.5	717	-
Western Canada	72.6	6.2	12	
Ontario	72.2	6.5	717	N.S.
Quebec	70.3	6.2	21	
Ontario	72.2	6.5	717	-
Atlantic Canada	74.5	6.5	4	
SCIENCE				
Ontario	73.3	9.0	1972	N.S.
Western Canada	72.7	6.3	18	
Ontario	73.3	9.0	1972	0.05
Quebec	69.8	8.4	34	
SOCIAL SCIENCE				
Ontario	70.4	6.6	2377	N.S.
Western Canada	71.7	8.1	31	
Ontario	70.4	6.6	2377	N.S.
Quebec	69.3	6.7	93	
Ontario	70.4	6.6	2377	-
Atlantic Canada	73.1	3.8	7	
ENGINEERING				
Ontario	64.0	12.1	609	-
Western Canada	65.8	11.0	8	
Ontario	64.0	12.1	609	N.S.
Quebec	65.1	9.7	18	

*A simple T-test was used for this statistical analysis.

Table 17: Percentage of Students by Program and Region Who (a) Completed Year 1 Without Failure, (b) Completed Year 1 With One or More Failures, (c) Withdrew - University C, 1977, 1978, 1979

Program		Region											
		Ontario			Quebec			Western Canada			Atlantic Canada		
		No Failures	1 or More Failures	Withdrew	No Failures	1 or More Failures	Withdrew	No Failures	1 or More Failures	Withdrew	No Failures	1 or More Failures	Withdrew
Arts	N	717	228	57	21	7	2	12	3	1	4	2	1
	%	71.6	22.8	5.7	70.0	23.3	6.7	75.0	18.8	6.3	57.1	28.6	14.3
Science	N	1972	1048	157	34	9	5	18	13	2	2	5	0
	%	62.1	33.0	4.9	70.8	18.8	10.4	54.5	39.4	6.1	28.6	71.4	0
Social Sciences	N	2377	1097	146	93	66	2	31	17	3	7	5	1
	%	65.7	30.3	4.0	57.8	41.0	1.2	60.8	33.3	5.9	53.8	38.5	7.7
Engineering	N	609	46	54	18	1	0	8	0	2	1	1	1
	%	85.9	6.5	7.6	94.7	5.3	0	80.0	0	20	33.3	33.3	33.3
Totals	N	5675	2419	414	166	83	9	69	33	8	14	13	3
	%	66.7	28.4	4.8	64.3	32.2	3.5	62.7	30.0	7.3	46.7	43.3	10.0

Ontario Grade 12 students with minimum average of 70 per cent may be admitted to the qualifying-year level. Local (Ontario) high school students may participate in the "concurrent studies" program. This program allows students to take some first-year university-level courses while completing their Grade 13 program. Any student who has completed Ontario Grade 12 with a minimum average of 70 per cent in addition to one or more Grade 13 subjects may participate.

Students from Quebec may be accepted to the first-year or qualifying-year level depending on their qualifications. Students with a minimum third-class honours standing from the first year of a Quebec CEGEP will be considered for admission to the first-year level. Quebec students applying on the basis of high school studies will be considered for admission to the qualifying-year level. In general, applicants require the Quebec Secondary V Certificate (Grade 11) with a minimum average of 75 per cent including six, two-unit college-preparatory subjects at the Secondary V level.

Students from other provinces may be considered for admission to either the qualifying-year or first-year level, depending on their academic qualifications. Generally speaking, applicants must meet the requirements for admission to a university in their own province or country.

The following certificates are recognized as equivalent to Grade 13 and may be accepted to meet admission requirements to the first-year level: Grade 12 (Senior Matriculation) from Alberta, British Columbia, Manitoba, New Brunswick, Nova Scotia, Prince Edward Island, and Saskatchewan. As with Ontario applicants, minimum averages vary according to faculty (see above), but no variation in requirements is applied by region.

The following certificates are recognized as approximately equivalent to the Ontario Secondary School Graduation Diploma (Grade 12) and may be accepted to meet admission requirements to the qualifying-year level of University D:

- High School Graduation (Grade 11), Newfoundland;
- Junior Matriculation (Grade 11), Nova Scotia;
- High School Graduation (Grade 12), United States.

The admissions officer of University D reported little discernible difference in the performance of Ontario Grade 13 students compared to that of students from other provinces. There was an impression that Ontario Grade 13 graduates and CEGEP graduates are stronger in mathematics than students from other provinces. In fact, students from Atlantic Canada and Western Canada may be required to take Qualifying-Year courses to make up academic weaknesses. For example, University D often requires these students to take the qualifying-year calculus course as a supplement to their first-year courses.

Academic achievement. University D does not draw large numbers of students from outside Ontario. Table 18 presents the matriculation marks of the 1978 and 1979 first-year students by program area and geographic region. It can be seen that the numbers of students in some categories would make comparisons meaningless. In all cases, out-of-province entrants begin with higher average marks than Ontario entrants.

Table 18: Matriculation Marks* of Entrants - University D, 1978, 1979

Program/Region	Mean	Standard Deviation	Number of Students
Arts			
Ontario	73.37	7.54	920
Western Canada	83.14	7.15	58
Quebec	78.34	5.02	35
Atlantic Canada	82.50	8.69	46
Science			
Ontario	79.40	8.07	137
Western Canada	82.70	4.06	4
Quebec	82.48	4.99	21
Atlantic Canada	88.18	2.33	4
Engineering			
Ontario	78.62	7.72	256
Western Canada	86.73	4.87	4
Quebec	80.97	4.27	9
Atlantic Canada	84.95	9.12	2

* The term Matriculation marks in this study refers to the average marks obtained by students in the last year of pre-university school, whether it be Grade 13, or the first year of a CEGEP.

Table 19: First-Year-University Marks of Entrants - University D, 1978, 1979

Program/Region	Mean*	Standard Deviation	Number of Students
Arts			
Ontario	6.86	1.65	970
Western Canada	8.08	1.53	58
Quebec	6.69	1.78	35
Atlantic Canada	6.87	1.98	46
Science			
Ontario	7.54	2.27	137
Western Canada	7.68	2.06	4
Quebec	8.07	1.50	21
Atlantic Canada	6.08	.59	4
Engineering			
Ontario	7.18	1.91	256
Western Canada	6.83	2.01	4
Quebec	8.56	2.02	9
Atlantic Canada	6.60	2.26	2

* A mean was derived by equating A+ with 12, A with 11, A- with 10, and so on. The university uses letter grades which are transformed to numerical equivalents to compute averages.

Table 20: Comparisons by Region and Program of Unadjusted First-Year Marks - University D, 1978, 1979

Program/Region	Mean*	Standard Deviation	Number of Students	Significance** of Difference
Arts				
Ontario	6.86	1.65	970	.01
Western Canada	8.08	1.53	58	
Ontario	6.86	1.65	970	N.S.
Quebec	6.69	1.78	35	
Ontario	6.86	1.65	970	N.S.
Atlantic Canada	6.87	1.98	46	
Science				
Ontario	7.54	2.27	137	N.S.
Quebec	8.07	1.50	21	

* A mean was derived by equating A+ with 12, A with 11, A- with 10, and so on. The university uses letter grades which are transformed to numerical equivalents to compute averages.

** A simple T-test was used for this statistical analysis.

Table 21: Comparisons by Region and Program of Adjusted First-Year Marks* - University D, 1978, 1979

Program/Region	Mean**	Standard Deviation	Number of Students	Significance*** of Difference
Arts				
Ontario	8.16	1.56	116	N.S.
Western Canada	8.08	1.53	58	
Ontario	7.41	1.59	105	0.05
Quebec	6.69	1.78	35	
Ontario	7.76	1.78	96	0.01
Atlantic Canada	6.87	1.98	42	
Science				
Ontario	8.14	1.74	42	N.S.
Quebec	8.07	1.50	21	

* In this adjusted marks analysis, a sample of Ontario students was drawn from each incoming average mark range (e.g., 86+, 85-86, 83-84, etc.) in proportion to the percentage of out-of-province students falling in that mark range.

** A mean was derived by equating A+ with 12, A with 11, A- with 10, and so on. The university uses letter grades which are transformed to numerical equivalents to compute averages.

*** A simple T-test was used for this statistical analysis.

The first-year university marks that appear in tables 19, 20, and 21 represent computations based on the numerical equivalents that the university assigns to letter grades in order to compute averages (i.e., A+ =12, A =11, A- =10, B+ =9, and so on). The only significant difference found in the unadjusted first-year marks was in the case of Western Canadian students achieving higher marks than Ontario students in arts (table 20). When the marks were adjusted to take into account differences in matriculation marks, no significant difference was found between Western Canada and Ontario students in arts, and Ontario students had significantly higher marks than students from both Quebec and Atlantic Canada (Table 21).

University E

Admissions/accommodations. University E is a large educational institution outside of Ontario which attracts substantial numbers of out-of-province students, including Ontarians as well as students from the United States (and overseas). This university, established in the first quarter of the nineteenth century, today offers some sixteen undergraduate degrees including arts, science, commerce, and engineering. The regular university program is three years in length (90 credits), but for students who do not meet the requirements for admission to this program, there is a four-year program (120 credits) which incorporates a "freshman" or qualifying year (30 credits). Students may elect to undertake a general or honours program, both of which are the same in length.

Admission is highly selective, and the criteria vary according to the academic background of applicants. Quebec students who have completed the two-year Diploma of Collegial Studies at a CEGEP in that province, with an average of at least 60 per cent, are considered for admission into all of the regular three-year degree programs. Ontario students who have completed Grade 13 can gain admission into the regular three year degree programs in arts and commerce. In the case of the latter, Ontario students require mathematics courses at the Grade 13 level in relations and functions and in calculus. If one or more of these are lacking, a student is required to make up the additional credit or credits by taking the appropriate freshman credit. Ontarians are also considered for admission into the regular science program, but are required to complete an additional semester of calculus and physics unless they pass the placement tests in these subjects, which may be written on campus prior to registration. The admissions officer reported that Grade 13 students are routinely admitted on a par with two-year CEGEP students and that in practice tests are rarely required. Ontario students, even with Grade 13 mathematics, like the out-of-province students who have completed Grade 12 (or first-year university in Newfoundland), are required to take the freshman year in science before proceeding to engineering. Only the Quebec CEGEP students who hold the Diploma of Collegial Studies are permitted to enrol in a three-year engineering program.

Students with Grade 12 from the other provinces, like their United States counterparts, are not admitted into the three-year program unless they have advanced standing from some other university. They normally take the freshman year before enrolling in a degree program. In addition to Grade 12, United States students are required to write the College Entrance Examination Board tests including the Scholastic Aptitude Test (SAT) and three other Achievement Tests. In the case of SAT, United States students must achieve a score of at least 550 on both the verbal and mathematical tests. These levels of achievement are typical only of the top fifteenth percentile and top quartile of United States college-bound seniors who write the verbal and mathematical tests respectively. In view of such stringent criteria, it would come as no surprise if the United States students who attended University E were better academic achievers than their Canadian peers.

Table 22 outlines the minimum admittance standards required of applicants. The third column shows to what degree path the students are admitted.

The admissions officer was asked to comment on mark averages for incoming students from the different regions. However, no discernible difference from one province to another was reported.

Table 22: Minimum Admission and Degree-Program Requirements by Province/United States - University E

Province/ United States	Minimum Admission Requirements	Degree Program
Ontario	Grade 13	90 credits, 3 years
	Grade 12 with 80% average	120 credits, 4 years
Quebec	Two-year CEGEP	90 credits, 3 years
Nova Scotia, Prince Edward Island, New Brunswick, Manitoba, Saskatchewan, Alberta, British Columbia	Grade 12	120 credits, 4 years
Newfoundland	Grade 11 plus one full year of study at Memorial University	120 credits, 4 years
United States	Grade 12	120 credits, 4 years

There is slight variation in the marks required for admission by the different faculties: engineering--at least 70 per cent, in science and mathematics; commerce--70 per cent; arts--a consistent 68 per cent to 70 per cent; and science--65 per cent.

Table 23: First-Year-University Marks of Entrants - University E, 1978, 1979, 1980

Program/Region	Mean	Standard Deviation	Number of Students
Arts			
Ontario	2.81	.69	181
United States*	3.13	.62	371
English CEGEPs	2.56	.75	2079
French CEGEPs	2.62	.85	494
Atlantic Canada*	3.01	.49	22
Western Canada *	3.27	.57	59
Science			
Ontario	2.48	.91	88
United States*	2.69	.69	281
English CEGEPs	2.84	.81	968
French CEGEPs	2.44	.85	285
Atlantic Canada*	2.64	.89	18
Western Canada*	2.95	.79	48
Commerce			
Ontario	2.69	.56	33
United States*	3.08	.54	34
English CEGEPs	2.87	.58	714
French CEGEPs	2.63	.68	263
Atlantic Canada*	2.56	.30	5
Western Canada*	2.80	.47	14
Engineering			
Ontario*	2.72	.62	104
United States*	2.72	.74	55
English CEGEPs	2.78	.79	759
French CEGEPs	2.75	.70	179
Atlantic Canada*	3.27	.46	8
Western Canada*	2.88	.63	65

* Indicates that these students took the Freshman year before starting the regular program.

Interviews with admissions officers revealed no consensus of opinion regarding Grade 13 entrants as opposed to students from other provinces. No single impression was repeated by the five officers interviewed. In short, admissions officers were unable to offer firm impressions either for or against the success of Grade 13 students. They did not seem to stand out from their peers as more socially mature, nor were they perceived as more or less academically motivated.

Academic Achievement. Achievement information from University E was supplied in the form of grade-point averages, with the students classified in terms of province or country of origin and program taken. Matriculation marks and mark distributions were not made available to us; therefore, our achievement analysis was limited.

Table 23 shows the grade-point average of first-year arts, science, commerce, and engineering students by place of origin for the individual years 1978, 1979, and 1980, as well as the means and standard deviations aggregated for the years 1978-80.[2] The asterisks indicate the groups of students who were admitted into the qualifying or freshman year at University E before beginning a regular program. In the case of the arts program, unlike the Ontario Grade 13 and CEGEP students, freshman students would have already spent a year on campus. Thus, the academic achievement of the freshman groups may not be strictly comparable with Ontario or Quebec entrants into the regular programs. They are none the less included because they are comparable among themselves, and because they may be of interest to educational reformers who advocate a preparatory year within the university itself.

Table 24 shows the comparisons by region where numbers and comparability warrant the use of a T-test. As is evident in the aggregated data for 1978-80, Ontario Grade 13 students who completed the first year of the arts program, on average, were more successful than the CEGEP students, but less successful than the students who took the freshman program, particularly the students from Western Canada and the United States. The average for the Ontario students, though higher than that of both English and French CEGEP students, is lower than that of their peers from Western and Eastern Canada and the United States. But whether these differences, albeit statistically significant, are educationally significant, given the range of first-year arts courses available as well as the subjectivity of marks in arts subjects as a whole, is debatable. If the data suggest anything, it is that students who take the freshman year do better as a group in first-year arts than Ontario Grade 13 students who entered University E directly from high school or CEGEP students who took a Diploma of Collegial Studies.

Except for the group of students from the French CEGEPs, the average science mark of Ontario students is lower than the rest and also more variable (table 23). The United States students as a group were the best achievers and also had the least variation in marks, rivalled only by students from Western Canada. The hypothesis that students do better after taking the freshman year still holds, but not as convincingly in science as in arts.

Table 24: Comparisons by Region and Program of Unadjusted First-Year Marks - University E, 1978, 1979, 1980

Program/Region	Mean*	Standard Deviation	Number of Students	Significance** of Difference
Arts				
Ontario	2.81	0.69	181	0.01
English CEGEPs	2.56	0.75	2079	
Ontario	2.81	0.69	181	0.01
French CEGEPs	2.62	0.85	494	
Science				
Ontario	2.48	0.91	88	0.01
English CEGEPs	2.84	0.81	296	
Ontario	2.48	0.91	88	N.S
French CEGEPs	2.44	0.85	285	
Commerce				
Ontario	2.69	0.56	33	0.10
English CEGEPs	2.87	0.58	714	
Ontario	2.69	0.56	33	N.S
French CEGEPs	2.63	0.68	263	
Engineering				
Ontario	2.72	0.62	104	N.S
United States	2.72	0.74	55	
Ontario	2.72	0.62	104	N.S
English CEGEPs	2.78	0.79	759	
Ontario	2.72	0.62	104	N.S
French CEGEPs	2.75	0.70	179	
Ontario	2.72	0.62	104	N.S.
Western Canada	2.88	0.63	65	

* Average based on a grade-point system of 1 to 4.

** A simple T-test was used for this statistical analysis.

The average for the Ontario students in the commerce program is marginally lower than that of the English CEGEP students. Of the groups shown, the French CEGEP students display the most variation in mark distribution. The marks of the Ontario students are also exceeded, on average, by students from the United States, the English CEGEPs, and Western Canada (table 23). Again, it would seem that exposure to the freshman year is a factor that contributes to higher academic achievement.

Unlike the programs in arts, science, and commerce, which Ontario Grade 13 students enter directly from high school, in engineering all out-of-province students, that is, non-CEGEP graduates, are required to take the freshman or qualifying year in science before entering the regular program. What is most striking, apart from the average for the Atlantic Canada students, whose numbers are too small to have significance, is that the average marks in the aggregate for the various groups vary only slightly from one another. Within the groups themselves (excluding Atlantic Canada), Ontario students show the least variation, followed by Western Canada; the English CEGEP students show the most variation. However, the differences in the average marks among the groups of students from Ontario, the United States, the English and French CEGEPs, and Western Canada are not significant. Given the heavy emphasis on mathematics, physics, and chemistry in engineering, the absence of major achievement differences is of some consequence. The data suggest that a preparatory year at university is perhaps more academically advantageous than direct entry into the regular program. Compared to Ontario students in this program, the high school graduates of a twelve-year system save a year by taking the freshman or qualifying year program and also do as well as their Ontario peers.

Since University E did not provide us with data on the academic achievement of the incoming students, we were unable to compare the academic achievement of the students in their first-year courses on the basis of similar matriculation marks.

University F

Admissions/accommodations. University F is located in a Western Canadian province and attracts sufficient numbers of Ontario students to make comparisons worth while.

The admissions policy followed at University F is that applicants must have achieved the same university-admission requirements that they would need in their home provinces. No variation is reported from this standard. No adjustments are made for students from other provinces or from the United States; no advanced standing is granted in any case; and no tests are given as part of the admission requirements.[3]

The minimum admission requirements are summarized by province in table 25. Specfic requirements exist for fourteen different faculties. These requirements are designed to ensure the academic suitability of the individual applicant and to avoid the need for making adjustments for variations from one provincial high school system to another.

Table 25: Minimum Admission Requirements by Province/United States - University F

Province/United States	Minimum Admission Requirements
Manitoba	Standing in twenty high school credits. Five of these credits must be at the third year level in at least four different subject areas, with a minimum of these at the 300 (advanced) level.
British Columbia, Yukon Territory, New Brunswick	Completion of Grade 12 with an overall average of C or better
Alberta, Northwest Territories, Nova Scotia	Completion of Grade 12 with an overall average of 60 per cent or better
Saskatchewan	Completion of Grade 12 with an overall average of 65 per cent or better
Ontario	Completion of six credits in Ontario Grade 13 with an overall average of 60 per cent or better.
Quebec	Completion of the first year of a CEGEP with a satisfactory standing (normally a grade-point average of 2.0 or better, or 60 per cent or better, depending on the marking scheme)
Prince Edward Island	Grade 12 with a minimum of 60 per cent in a University-entrance program
Newfoundland	Completion of the first year of Memorial University with satisfactory standing
United States	Grade 12 with a minimum high school average of C or better and College Entrance Examination Board ACT* or SAT scores are required

* American College Testing Program

Impressions of Ontario Grade 13 students were solicited in an interview with the admissions officer of University F. The admissions officer felt that Grade 13 students had a slight advantage in mathematical skills, especially calculus, and in chemistry. However, Grade 13 students did not seem to be superior in English. The fact that Grade 13 students were generally one year older than the students from the home province put them slightly ahead of students from this province in social maturation.

Academic achievement. Out-of-province enrolments in the programs offered by University F, other than those from Ontario, were quite low; therefore, the basic comparisons were confined to students from Ontario and students from the province in which this university is located. From tables 26, 27, and 28 it can be seen that differences in matriculation marks between students from Ontario and local students were not great; in fact, the differences were not statistically significant. When a sample of local students was selected to match the Ontario students' incoming marks, the differences were still minor: Ontario students had slightly higher marks in engineering (table 28).

Thus, Ontario students moving outside their province achieved as well as or better than local students. Apparently, whatever educational preparation was necessary to overcome the disadvantages associated with attending secondary schools in this province was provided in the Ontario program. Perhaps the extra year in Ontario facilitated the adjustment process.

Achievement of the "Better" Students

An argument has been made by some Ontario university officials that the better students from Ontario achieve higher grades and receive more scholarships proportionately than do students from other provinces. In order to test this hypothesis first-year-university mark distributions for the four Ontario universities used in this study and for one of the universities from another province were examined. A figure of 80 per cent or above (or its equivalent in grade-point average) was chosen to represent the academic achievement of the "better" students. The students were classified according to origin, program, and percentage achieving an average mark of 80 or greater. This information is presented in tables 29, 30, 31, 32, and 33.

In University A a greater proportion of Ontario arts students than of arts students from elsewhere achieved average marks of 80 per cent or above. There were no differences among science students from Ontario, Western Canada, and Quebec, but fewer students from Atlantic Canada received high marks. Ontario and Quebec students achieved similarly in commerce, but fewer Western Canadian students achieved superior marks. In engineering significantly more Quebec students achieved high marks than did Ontario students.

Table 26: Matriculation Marks* of Entrants From Ontario and a Western Province - University F, 1977, 1978, 1979

Program/Region	Mean	Standard Deviation	Number of Students
Arts			
Ontario	72.55	7.27	19
Western province	74.32	9.02	553
Science			
Ontario	73.35	7.37	45
Western province	75.48	9.74	586
Commerce			
Ontario	77.81	8.44	16
Western province	75.53	9.30	425
Engineering			
Ontario	70.90	9.23	15
Western province	75.15	9.56	390

* The term matriculation marks in this study refers to the average marks obtained by students in the last year of pre-university school, whether it be Grade 13 or Grade 12.

Table 27: Comparisons by Program of Ontario Students and Local Provincial Students of Unadjusted First-Year-Marks - University F, 1977, 1978, 1979

Program/Region	Mean*	Standard Deviation	Number of Students	Significance** of Difference
Arts				
Ontario	2.65	0.73	25	N.S.
Western province	2.63	0.78	791	
Science				
Ontario	2.71	0.85	48	N.S.
Western province	2.84	0.87	824	
Commerce				
Ontario	2.69	0.66	18	N.S.
Western province	2.46	0.80	584	
Engineering				
Ontario	2.93	0.88	15	N.S.
Western province	2.68	0.92	534	

* Average based on a grade-point of 1 to 4.

** A simple T-test was used for this statistical analysis.

Table 28: Comparisons by Program of Ontario Students and Local Provincial Students of Adjusted First-Year Marks*- University F, 1977, 1978, 1979

Program/Region	Mean**	Standard Deviation	Number of Students	Significance*** of Difference
Arts				
Ontario	2.56	0.70	17	N.S.
Western Province	2.46	0.80	85	
Science				
Ontario	2.71	0.90	39	N.S.
Western Province	2.85	0.87	117	
Commerce				
Ontario	2.62	0.70	15	N.S.
Western Province	2.57	0.83	75	
Engineering				
Ontario	3.18	0.65	13	.10
	2.72	0.93	65	

* In this adjusted marks analysis, a sample of the students from the Western province was drawn from each incoming average mark range (e.g., 86+,85-86, 83-84, etc.) in proportion to the percentage of Ontario students falling in that mark range.

** Average based on a grade-point system of 1 to 4.

*** A simple T-test was used for this statistical analysis.

Table 29: Percentage of Students Achieving 80 or Above in First-Year University by Region and Program - University A

Regions	Arts		Science		Commerce		Engineering	
	%	No.	%	No.	%	No.	%	No.
Ontario	9.4	(556)	26.5	(336)	19.9	(146)	11.2	(240)
Western Canada	6.1	(115)	26.2	(81)	14.3	(21)	10.5	(57)
Quebec	3.6	(138)	27.4	(57)	19.1	(47)	20.4	(54)
Atlantic Canada	4.0	(25)	13.3	(30)	-	(1 of 7)	-	(2 of 9)

Table 30: Percentage of Students Achieving 80 or Above in First-Year University by Region - University B

Region	Percentage	Number of Students
Ontario	8.9	269
Western Canada	0	42
Quebec	12.3	138
Atlantic Canada	4	25

Table 31: Percentage of Students Achieving 80 or Above in First-Year University by Region and Program - University C

Regions	Arts		Social Sciences		Science		Engineering	
	%	No.	%	No.	%	No.	%	No.
Ontario	2.6	(717)	9.7	(2377)	25.5	(1972)	11.9	(609)
Western Canada	16.6	(12)	22.7	(31)	11.1	(18)	0	(8)
Quebec	4.8	(21)	8.7	(93)	17.7	(34)	5.6	(18)
Atlantic Canada	0	(4)	0	(7)	0	(2)	0	(1)

Table 32: Percentage of Students Achieving A- or Above in First-Year University by Region and Program - University D

Region	Arts		Science	
	%	No.	%	No.
Ontario	3.6	970	19.7	137
Western Canada	12.1	58	-	-
Quebec	2.9	35	14.3	21
Atlantic Canada	8.7	46	-	-

Students from Quebec were the highest achievers at University B, with Atlantic and Western Canadian students at the bottom. Quebec students achieved well in mathematics-oriented programs in both universities A and B.

The number of students from Atlantic Canada in University C was too small to be considered in the analysis. Western Canadian students obtained the greatest proportion of average marks of 80 or above in the arts and social sciences programs, while the figures for Quebec and Ontario students were quite similar. Ontario students obtained the greatest proportion of average marks of 80 or over in both science and engineering.

Table 33: Percentage of Students Achieving a Grade-Point Average of 3.5 or Above in First-Year University by Region and Program - University F.

REGION	PROGRAM							
	ARTS		SCIENCE		COMMERCE		ENGINEERING	
	%	No.	%	No.	%	No.	%	No.
Ontario	11.8	17	25.6	39	13.3	15	46.2	13
Western	15.0	421	25.6	469	15.0	327	21.7	286

In the arts program of University D students from Western Canada obtained the greatest proportion of average marks of A- or above followed by students from Atlantic Canada. Slightly more students proportionately from Ontario than from Quebec achieved A- or above. Thus, the data from universities C and D run counter to the data from universities A and B.

In University F Ontario students achieved approximately the same proportion of high grade-point averages, 3.5 or above, as did local students in arts, science, and commerce and a higher proportion in engineering.

Overall, no strong case can be made to support the contention that the "better" Ontario students achieve proportionately more of the high marks than the "better" students from other provinces.

Social and Emotional Adjustment of Students at University

If a student's age does not appear to influence his/her academic achievement at university, he/she still may suffer adjustment problems at university because of his/her youthfulness. It is also possible that curriculum and counselling inadequacies in a student's home province may leave him/her unprepared for the stress of university life. Information was obtained regarding students who sought counselling at University A. In order to determine whether out-of-province students suffered more adjustment problems than students from within the province, three years of student-services information for first- and second-year students were classified into three categories of counselling: vocational counselling was

concerned with career issues; academic counselling was concerned with course problems, study habits, and so on; and personal counselling was concerned with emotional problems, sexual and drug-related concerns, and so on. Three classifications of home residence were established for the Ontario students: those who lived within 40 km of the university; those who lived more than 40 km away but less than 240 km away; and, to more closely correspond to the out-of-province students, those who lived more than 240 km away. This information is summarized in table 34, along with the proportion of University A students in each of these three categories.

Chi-squares were computed for each of the three types of counselling using the proportions of the total number of first- and second-year students in each home-residence category. None of the results were found to be significant at $P<.05$ or less. However, the out-of-province students were slightly overrepresented in the academic- and personal- counselling categories (i.e., based on the proportions of the population, there were more students than one would expect who had sought this type of counselling), and those students from the university vicinity were underrepresented in all three counselling categories. In-province students from more than 240 km away appeared to have the greatest need for all three types of counselling. In any case the differences were not pronounced and lend little support to the position favouring the superiority of the Ontario school system as preparation for university from a social-maturation perspective.

Age at Entry to University

It has been argued that physical and social maturity are greater at nineteen than at eighteen years of age, and the greater the maturity, the better the quality of achievement at university. In most provinces students progressing through school at "normal" rates enter university in their eighteenth year (i.e., their eighteenth birthday will occur before the end of December of that year). The exceptions to this pattern are in Ontario, Newfoundland, and Quebec. In Newfoundland the most common practice is for a student to enter university in his/her seventeenth year. In Ontario and Quebec first-year-university enrolment most commonly takes place in a student's nineteenth year. Only in Ontario does one find a significant number of students who are younger than the norm for the province entering university; approximately one-quarter of Ontario students are in their eighteenth year at university. Since students from Quebec are admitted into Ontario universities after one year at a CEGEP, all out-of-province students who enter Ontario universities are on an average about three-quarters of a year younger than their Ontario counterparts.

Table 34: Referrals to Student Services for Vocational, Academic, and Personal Counselling* - University A

Type of Counselling Activity		Out of Province/ Canada	IN-PROVINCE			Total
			240 km Away	Less Than 240 km Away	University Vicinity	
Vocational	Number	40	143	67	40	290
	% of total	13.8	49.3	23.1	13.8	100
Academic	Number	64	163	85	65	377
	% of total	17.0	43.2	22.5	17.2	100
Personal	Number	52	112	57	34	255
	% of total	20.4	43.9	22.4	13.3	100
Proportions of Total First-/and Second-Year Students		14.2	38.6	26.1	21.1	100

Chi-square:

Vocational = 5.85 3df N.S.
Academic = 2.32 3df N.S.
Personal = 6.34 3df <.10

*Some counselling sessions involve more than one type of counselling (e.g., academic and vocational); therefore, a student may appear in more than one counselling category.

Table 35 shows the proportion of students remaining in the formal system (including universities, community colleges, and special provincial educational institutions) by province and age. This table shows the high proportion of Ontario's young people in school in comparison with other provinces. This is attributable in part to three factors: (a) higher proportions of students attend community colleges in Ontario than in other provinces: (b) the greater perception held by Ontario students in comparison with other provinces that post-secondary education is available to them encourages more of them to remain in school; and (c) in general it takes Ontario students longer to complete community college and university programs than is the case for students from other provinces.

The removal of a fifth year from Ontario's secondary school system could have a dramatic effect on these figures. It will certainly reduce the percentage of Ontario students who are in school from age nineteen on. While the advantage of more post-secondary educational opportunities in Ontario will remain, the view that accessibility to post-secondary education would be unlikely will come earlier in the school careers of low-achieving students. This could have the effect of encouraging more students to leave school earlier.

In summary, while age does not seem to strongly influence achievement in university, a change in age at entry to post-secondary educational institutions could affect both the enrolments of these institutions and the economy in general.

Table 35: Percentage of Students in School by Age and Province, 1979-80

	Age					
PROVINCE	17	18	19	20	21	22
Ontario	78.2	46.5	34.0	25.4	21.0	15.3
British Columbia	70.7	27.7	17.5	13.2	12.0	9.3
Alberta	59.2	27.9	20.9	17.0	14.3	9.5
Saskatchewan	68.2	25.0	17.9	12.7	11.9	8.0
Manitoba	66.2	30.6	20.8	15.9	13.4	9.0
Quebec	-	30.2	30.1	21.7	15.3	11.6
New Brunswick	69.0	35.4	22.9	14.7	12.0	7.4
Nova Scotia	69.5	37.8	26.2	19.6	17.0	11.3
Prince Edward Island	69.2	36.2	26.2	17.7	11.3	6.4
Newfoundland	46.1	21.6	12.9	8.0	6.1	3.9

Source: Statistics Canada, Education in Canada, 1980, p. 130.

Secondary School Curriculum

It is difficult to determine the effects of differences in secondary school curriculum on university achievement, because the universities themselves have developed adaptive mechanisms that make adjustments for these differences. Courses are offered at different degrees of complexity, or students are allowed to take a course at the university level that they have not taken at the secondary school level. These accommodation strategies tend to mask differences in preparation. Nevertheless, an attempt has been made to understand the role played by differences in educational curriculum from province to province with respect to university achievement by focusing on two subject areas--mathematics and English. In this subsection the secondary school curriculum content in these two subject areas is analysed by province in order to understand more fully the differences and similarities in educational achievement presented in the second subsection of this section of the report.

If the Ontario Grade 13 graduates perform better than "out-of-province students" in first-year-university mathematics courses, this phenomenon could be related to their having had more secondary school mathematics of a type that would be advantageous in university courses, or to their greater maturity resulting from their having had an extra year of mathematics at the secondary school level.

On the basis of an examination of the content of the secondary school mathematics curricula and guidelines in different provinces, as well as the first-year CEGEP mathematics courses, there is no reason to expect Ontario Grade 13 graduates to have any advantage over out-of-province students with respect to their performance in first-year-university mathematics courses. While it is true that the Grade 13 graduate has studied several mathematical topics not normally covered in the secondary school mathematics programs of other provinces, these topics (generally related to the properties and applications of isometrics) would not per se give the Ontario Grade 13 graduate an advantage.

The usual courses offered in first-year mathematics courses are calculus, linear algebra, and computer science. The calculus program in Ontario's Grade 13 is very similar to that offered as optional content or in honours Grade 12 courses in other provinces, but it is not as extensive as the first-level calculus course offered to CEGEP students. At any rate, any differences that may exist between secondary school calculus courses are usually offset by the tendency of instructors of first-year-university calculus to disregard the secondary school calculus background of their students.

The content of the Ontario Grade 13 algebra course is remarkably similar to the algebra courses available to secondary school students in other provinces. Thus, there is no reason to expect Ontario Grade 13 graduates to perform better than out-of-province students in first-year linear algebra.

Ontario does offer more computer science courses than are generally provided by the curricula of other provinces. Consequently, one might expect Ontario Grade 13 graduates to perform better than out-of-province students in computer science. One should note, however, that computer science courses in Ontario are optional and are

offered mainly in Grades 10, 11, and 12. Only a few Grade 13 computer science courses are offered by a few interested mathematics departments or teachers who have special approval from the Ministry of Education.

From a pedagogical and social perspective, there is no reason to believe that exposing students to an additional year of high school would result in their performing better in university mathematics courses. One might hope that the additional year of mathematics instruction afforded by the Grade 13 courses would give students a more mature view of mathematics as a whole, and, hence, give them an advantage in their subsequent mathematical study. Unfortunately, however, teaching high school students for an additional year is unlikely to result in their having an expanded and sophisticated view of mathematics. In fact, one might expect the CEGEP students to perform better in university mathematics courses, not only because their mathematics courses are more extensive than the Ontario Grade 13 courses and the Grade 12 programs of other provinces, but also because the nature of the instruction in the CEGEP more closely parallels the instructional style encountered in first-year-university mathematics courses.

It appears that, in all of the provinces represented in this study, English is a required subject in each senior grade or virtually becomes one from choice. Provincial curriculum guidelines for English in the senior grades (Grades 10, 11, and 12 in most provinces), since 1976, indicate a common pattern: an increased emphasis on learning outcomes, an indication of time allocations for course material, an integration of literature and composition, and grammar instruction based on student writing difficulties.

The assignment load in senior English in all provinces varies widely from course to course. However, the "critical essay" based on an intensive reading of one work or the extensive reading of several novels and/or plays seems to be the main vehicle of assessment, other than tests and exams. The number (length and type) of essays required in each course seems to be left to the discretion of the instructor and/or his/her department. As the students advance to their senior year, they are usually expected to write more transactional (explanatory) assignments than expressive (e.g., short stories, poems) ones.

In Ontario the Grade 13 English program has changed from a two-credit (320 minutes per week of instruction) program in the 1960s to a one-credit (200 minutes per week) program in the 1980s. Even though Ontario guidelines reflect the autonomy that individual school boards have in designing curriculum, most school course outlines are comparable to the departmental (Ministry) literature courses of the 1960s, with the composition emphasis subsumed within the literature course. Although composition work may receive special attention within the literature section dealing with the formal and informal essay, grammar is taught incidentally. While most of the literature courses require the comparative study of novels and plays, at least one-third of the time allotted to these courses must be spent on writing and language study.

The extra year of writing practice obtained by Ontario students should assist them in those university courses where sustained writing is required. Arts students should benefit most from this extra practice in the writing of essays as well as in the extensive reading of literature.

As anticipated, there was a tendency for Quebec students to do as well as or better than Ontario students in courses involving mathematics, such as engineering. And, generally speaking, Ontario students tended to do as well as or better than students from other provinces in arts programs. But the differences were not great in many instances, and the patterns were not consistent from university to university.

Footnotes

1. Edward Sheffield, "Student Mobility No Simple Matter", University Affairs, August-September 1980.

2. Since individual student averages were not available from University E and the data supplied were by year, it was necessary to produce standard deviations that represented three years of combined data. The standard deviations were computed by employing the formula for the variance of two separate sets of scores and then taking the square root: $s^2 = [n_1-1)s_1^2 + (n_2-1)s_2^2 + n_1(\bar{X}_1-\bar{X}_{12})^2 + n_2(\bar{X}_2-\bar{X}_{12})^2] \div n_1+n_2-1$ where $\bar{X}_{12} = [n_1\bar{X}_1+n_2\bar{X}_2] \div n_1+n_2$.

3. In an interview with the admissions officer, it was noted that remediation courses are available in English and mathematics. They are both taken on a voluntary basis and are not required on the basis of test results. They are not in any way used to determine acceptance or refusal for admission. Mathematics is a non-credit course and English composition is a half-credit course.

V. Summary and Conclusions

This section attempts to pull together the somewhat disparate findings of this report in order to estimate the educational value of Grade 13. The primary focus is on differences in the first-year-university achievement of students according to the province in which their secondary school program was completed. The roles of age at university entry and the curriculum and organization of the educational systems in the various provinces in contributing to the achievement differences are also briefly considered. Finally, the limitations of this study are discussed and some tentative conclusions offered.

Summary

In this summary university-admissions information is combined with first-year achievement data from the six case-study universities in order to assess the quality of the students from Ontario's Grade 13 in a comparative setting. A small-scale analysis of the difficulties of adjusting to university is then summarized, and the section concludes with the study's findings on the implication of differences in age at entry to university and the influence of some provincial curriculum differences on preparation for university.

Grade 13 as Preparation for University

In order to determine the importance placed by university officials on differences in educational preparation by Canadian region, admission procedures in the six case-study universities (four universities in Ontario, two in other provinces) were analysed. The following indicators were used to rank the quality of preparation for university in the four regions: (Western Canada, Ontario, Quebec, and Eastern Canada):

- the average of secondary school marks required for entry;
- the actual average of secondary school matriculation marks at entry;
- the perceptions of admissions officers; and
- the special considerations given to students by province.

Where mark differentials were either specified or implied as admission requirements, Ontario students were typically allowed to gain entry to university with the lowest marks, followed by students from Quebec, Western Canada, and Atlantic Canada. Where there were clear matriculation-mark differentials by province at entry to university, Ontario students were allowed to enter with the lowest marks, followed by students from Quebec, Western Canada, and Atlantic Canada in that order. When admissions officers stated that there were differences in the preparation of students by province, they tended to state that Ontario and Quebec students were the best prepared (particularly in science and mathematics), followed by students from Western Canada and Atlantic Canada. In University E (outside Ontario) the admission requirements to the arts, science, and commerce programs equate Ontario Grade 13 graduates with second-year CEGEP graduates and require

students from other provinces to take a qualifying year. (This is not true in engineering.) In summary, it is clear that more weight is given by our total sample of universities to graduation from Grade 13 than to graduation from Grade 12 or its equivalent in other provinces.

Although there is no real reason to believe that the range of marks assigned to secondary school students varies substantially from province to province, first-year-university marks were analysed by province using unadjusted marks, as well as drew samples of Ontario students selected to represent proportionately the secondary school mark distributions of out-of-province students. This procedure took into account the typically higher matriculation marks for students from other provinces. The findings from the unadjusted marks analysis do not follow a common pattern. In arts programs Ontario students tend to do as well as or better than students from other provinces (except at University D where students from Western Canada achieve the highest marks). In science and engineering programs Quebec students tend to be slightly more successful. No differences were found among students from different regions in the commerce programs.

In the three Ontario universities from which comparable samples of Ontario students could be selected, Ontario students tend to receive the highest marks in engineering. Outside of engineering, Ontario students achieve as well as or better than students from other provinces. Students from Atlantic Canada typically rank at the bottom on all measures, while students from Western Canada show a variable pattern of achievement from university to university. Outside of Ontario, the Ontario students do at least as well as students from the home province. In the case of University E (outside Ontario), students from Ontario do as well as students from the home province in engineering when both groups start with the equivalent of Grade 13.

When we combine the admissions and achievement analyses, there is enough support for the position that, in general, Ontario students with Grade 13 are better prepared for university than are students with the equivalent of Grade 12 from other provinces. (It could also be argued that students from the first year of a CEGEP are as well prepared as or better prepared than Ontario students for science and engineering.) However, it must be noted that the differences in achievement favouring Ontario were not substantial.

First-year-university marks distributions were analysed by program and province of origin of students to see if the highest-achieving students were being drawn in equal proportions from each of the four regions. Again, a simple pattern was not discernible, but there was no real evidence to support the contention that Ontario students are likely to be overrepresented among the highest achieving students.

The achievement of American students from Grade 12 was examined in two of the case-study universities, one in Ontario and one in another province. Where admission standards were high and the students were first enrolled in a preliminary year (University E), American students did as well as or better than students from Canadian provinces. Where admission standards were somewhat lower for American students (University A), the students tended to achieve at a lower level than did

students from Canadian provinces. The better American students were quite competitive with university entrants from the Canadian provinces.

Adjustment to University

Student-services information from University A was analysed to determine whether students from outside the province were more likely to request counselling services. If this was the case, then it could be assumed that out-of-province students were having "adjustment" problems associated with their younger age than Ontario students and/or their lack of academic preparation. First- and second-year students from 1978-79, 1979-80, and 1980-81 were classified according to distance of their home residence from the university and the type of counselling sought--academic, vocational, or personal. Students from outside the province were slightly overrepresented in the academic- and personal-counselling categories, but in-province students from more than 240 km away were overrepresented in all three counselling categories. These differences were not statistically significant. If out-of-province students do experience greater adjustment difficulties, it was not evident from this data.

Age at Entry to University

Ontario students do enter university at a later age (about three-quarters of a year older) than do students from all other provinces except Quebec. More young people in the eighteen-to-twenty-four-year age group are in school in Ontario than in any other province. This is related to the age at entry to university and to Ontario's extensive community college system, which also draws heavily from this population. The removal of Grade 13 would likely reduce substantially the proportion of young people in the eighteen-to-twenty-four-year age group who are in school.

Provincial Differences in Secondary School Curriculum

Curriculum specialists in mathematics and English were invited to analyse the various provincial curricula in their subjects. Based on their analyses, they attempted to anticipate whether achievement differences would exist in the first year of university. No reason was found to expect Ontario students to achieve better than students from other provinces in mathematics (in fact, the slight advantage to Quebec students was foreseen). The calculus advantage of Ontario students was predicted to be offset by the fact that university instructors tend to disregard a background in calculus in their teaching. The extra year of English in Grade 13 was seen to be advantageous in arts programs where essay writing is an important component.

The analyses of only two subjects definitely limited the power of the specialists to predict the success of Ontario students in the first year of university in comparison with out-of-province students. However, they did anticipate the general pattern of achievement by region.

Conclusions

Limitations of the Study

One of the major difficulties of the study was that it was really not possible to compare equivalent samples of students by province in terms of first-year-university achievement. Students who choose to take up education in another province are not likely to be similar to those who remain in a province. Although the achievement of Ontario students in two out-of-province universities was examined, it was difficult to determine the influence on achievement of attending university in another province.

The sample of out-of-province students tended to be quite small when broken down by program. In many instances, particularly for students from Atlantic Canada, it was not possible to obtain a sufficient number of students to make useful comparisons. This is true even though two or three (and in one case four) cohorts of first-year students were included. As a result, it was necessary to group provinces together for the analyses and this, of course, masked differences among those provinces that were grouped together (i.e., into Atlantic Canada and Western Canada).

The students in the sample from outside the province tended to come to Ontario universities with higher marks on average than the students from Ontario. There was no reason to believe that the marks did not have approximately the same value from province to province; therefore, it was necessary to select Ontario samples drawn to parallel the final secondary school marks of students from other provinces. We believe, our adjustment procedures are quite valid, but because this approach restricted our analysis even more to the achievement of students from the higher ability ranges, the impact of secondary school preparation on university achievement became problematic. As well, the academic achievement of high-ability students tends to be less influenced by school organization and curriculum.[1]

The quality of the data used in this study was not always of the highest order. Averages were computed in different ways; students left before completing a year; and in some cases information was recorded erroneously. Although we did our best to standardize the data, it was not always possible.

Concluding Statements

It is important to understand that the various provincial educational systems, up to and including the provincial universities, are quite dissimilar. The suggestion that the removal of Grade 13 from the Ontario system substantially increases the similarities between Ontario and the other provinces is not valid. There are as many post-secondary school organizational differences as there are pre-university organizational differences from province to province. However, it is safe to say that Ontario students tend to be older at entry to and completion of university than students from other provinces.

The data analysed in this study enable us to show some advantage for Ontario Grade 13 graduates in comparison to Grade 12 graduates or their equivalent from other provinces in terms of first-year-university achievement. Certainly the differences are not great, and the decision to remove Grade 13 would probably be

best made on political and economic grounds rather than educational grounds. It does appear that there may be some advantages associated with the Quebec system of education, which should be explored further.

The removal of Grade 13 could have widespread economic and social implications for Ontario. Major changes to the system of school organization and the curriculum structure now in place should be considered very carefully before implementation with respect to their potential effects on (a) the patterns of school withdrawal of students; (b) post-secondary enrolments by age; (c) the supply and demand of trained workers; and (d) the relationship of school to the needs of the economy. The quality and structure of the educational experience for our young people should not be determined independently of the larger needs of our society.

Footnote

1. A good discussion of this issue appears in L.C. Comber and J.P. Keeves, Science Education in Nineteen Countries (Sweden: Halstead Press, 1973), pp. 173-77. See also T. Husen (ed.), International Study of Achievement in Mathematics: A Comparison of Twelve Countries (New York: John Wiley & Sons, 1967); and T.N. Postlethwaite, School Organization and Student Achievement (Stockholm: Almquist and Wiksell, 1967).

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